Volume 93 Number 12

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

INDUSTRY is moving rapidly toward the second stage in the federal program for controlled economy. Having taken measures to increase employment and wages, the government now contemplates making loans to finance industrial payrolls. . . . The spotlight at Washington (p. 13) is shifting from General Johnson and NRA to President Roosevelt for a momentous "next step," and to Capitol Hill, aflame with inflation sentiment. . . . Steel's leader in recent relations with the government, R. P. Lamont, (p. 11) steps out of the picture, Institute committees to carry on under the blue eagle.

Shipments, New Orders in Sharp Contrast

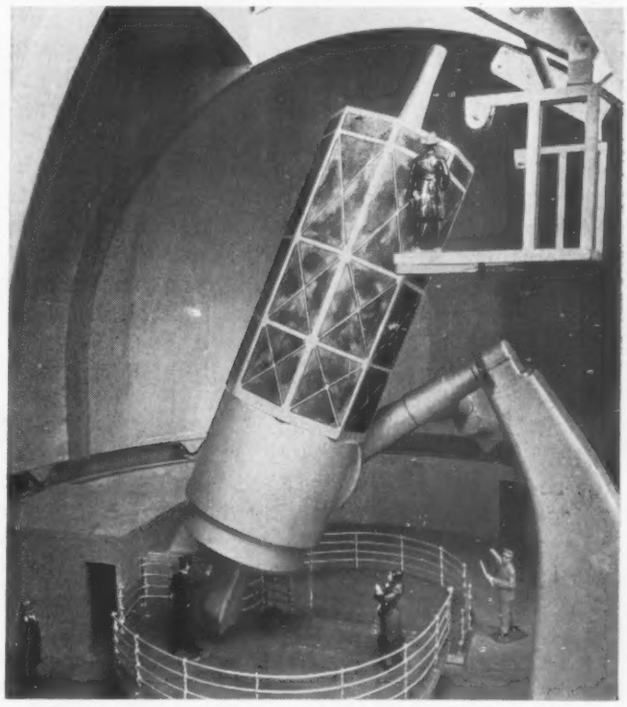
Underlying confidence has not been greatly disturbed by events of the week, but unless business makes an extraordinary come-back over the next two or three weeks steel faces a drab October. . . . A 1-point decline in steelworks operations to 41 per cent (p. 17) measures the further drain on backlogs, the closing out of shipments for this quarter not being followed up with new orders. . . . Not since March have the markets been enveloped in so much uncertainty (p. 35) leading steelmakers being undecided as to prices for many products for fourth quarter, and having little inquiry on which to quote.

Buying Power Reflected in Car Assemblies

Labor agitation in some iron and steel consuming industries is adding to the fog. . . . Typical of the problem many employers face is the action of the sheet, tin plate and bar iron producers (p. 47) last week in waiving the sliding-scale provisions of their wage agreements, first time in decades, arbitrarily increasing wages to comply with the NRA, out of all proportion with the advance in sales averages. . . . Tremendous buying power, however, must reside somewhere, as considering impending model changes the automotive situation is strong (p. 15) mainly in the low-price field, with assemblies this month close upon the 220,000 of August.

Stainless-Clad—How It Is Made and Used

High cost of stainless steel has mitigated against its use in many applications where the corrosion-resisting properties would be desirable. To break through this impasse, stainless-clad steel has been perfected, reducing the cost about one-half over solid stainless. The clad material is produced (p. 23) by placing two plates of stainless, separated by an insulating material and the edges welded over, in an ingot mold and pouring mild steel around them. This composite ingot is rolled to plate form, the ends



Steel aids in penetrating starry deep: A cylindrical steel house, steel track, bearings and other parts feature the new McDonald observatory, Texas, for which Warner & Swasey Co., Cleveland, is building world's second largest telescope. Alloy sheets cover the structure

and edges sheared, and the final plate broken apart to provide two plates of stainless-clad steel, with a 20 per cent layer of stainless on each. Applications are limited; special fabricating technique has been developed.

New Kinks To Enhance Value of Steel

Other methods for obtaining corrosion and abrasion resisting surfaces on mild steel include chromium plating and hardfacing. The former is being used (p. 28) in the pneumatic tool industry to reclaim pistons, cylinders and valves; the latter, applied to the blades for a vertical pug mill, has increased blade life (p. 28) from one to five weeks. . . . Metal, however, has taken second place to refractories in the construction of a combustion chamber for a wire baking oven (p. 32). Castings were found to warp and allow undesirable leakage of combustion products. Tongue-and-groove silicon carbide tile were adopted and a satisfactory combustion chamber built, improving economy substantially.

Barrels Cater to Nation's Thirsty Millions

The beer drinking season in most localities is drawing to a close, but barrel manufacturers continue to apply the spurs to production. A Detroit steel barrel manufacturer (p. 16) is turning out 1500 steel kegs daily. A Milwaukee plant, the past three years having manufactured a steel barrel for export, now announces the container available for domestic use. It is of welded steel (p. 32), pitch lined on the inside and hot galvanized on the exterior, although the outer surface may be lacquered or aluminized if desired. . . . Speaking of finishes, an automobile manufacturer is coating standard bodies with a new enamel (p. 28), claimed to be the most durable finish yet developed. It dulls slowly under exposure to weather, is resistant to radiator alcohol.

Theories and Practices Aid Industry

Continuing analysis of factors influencing rolling pressure and power consumption in the hot rolling of steel (p. 29), it is observed that in compressing a cylinder having a height greater than half of the diameter, the sides swell close to the contact surfaces, and later at the middle. A regular parallelopipedal deformation cannot take place. . . . Faced with the necessity for keeping coke ovens idle about six months ago, a Pittsburgh steelmaker (p. 33) filled the ovens with ashes while still warm, and sealed the tops, in an effort to keep the ovens warm until needed again. . . . Six 8-ton industrial-type gasoline locomotives are operated (p. 27) on a narrow-gage railroad at the World's Fair in Chicago to haul passenger coaches from downtown to the fair gates.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Small Manufacturers Handicapped

To the Editor:

There are many clauses in the fair practice codes published to date which are of great importance to every manufacturer, but the one problem which has caused price cutting and bankruptcy has been ignored.

This is the problem of the strictly manufacturing plant without means for producing his base materials such as bar stock, sheets, shapes, tubing, castings, forgings, etc. There are many plants which through years of hard manufacturing and sales effort have built up a public demand for a given product. After this volume demand was created, the large manufacturer of the base materials used, seeing the possible profits, started through their subsidiary companies or manufacturing departments to produce the items in question. Raw or base materials used in production are sold to the manufacturing departments or subsidiary companies on a cost plus low percentage handling charge basis, eliminating all sales expense.

This puts the manufacturer who is buying at market prices at a decided disadvantage because these subsidiary companies and manufacturing departments have entered the market and have been able to sell at lower prices due to their advantage of lower material costs.

Now, if you really are interested in the smaller manufacturer and want him to employ more men, it is the writer's suggestion that a fair practice clause in every code should cover the following:

That all raw materials must be charged into production cost on a basis of current market quotations, including delivery charges in establishing sales prices irrespective of whether the materials to be fabricated were obtained from subsidiary organizations or interlocking ownerships at lower cost.

Such a fair practice clause will have much to do in adjusting price wars. If the large corporations will come into the market on a fair price basis and outsell us who have no material cost advantages, they will be making the increased profits they are longing for today.

Take our own case. Through years of effort we developed one of the largest businesses in the nation on floor pumps for bicycle and automobile tire inflation. Recently, subsidiary companies and manufacturing departments of one or two steel tubing mills have entered this field establishing list prices that it is impossible for us to meet because the established market prices on steel tubing make the pump barrel the major factor in manufacturing cost.

There are thousands of companies who face this problem. Today it constitutes their greatest manufacturing handicap. The smaller plants have always borne the burden of higher prices and freight rates. Their one life buoy has been the lower hourly wage rate or longer working day. This, the codes are taking away to the advantage of the large corporation groups without giving us one equalizing factor in return.

It is immaterial how wide a margin of profit our competitors make but it is very essential that they arrive at their list prices and discounts on the same basis as we who must buy our raw materials in the open market

Frank Rose Mfg. Co.,
A. G. Alexander, Manager.
Hastings, Nebr.

Lamont Leaves Institute; for Present, Committees Carry On

DIRECTORS of the American Iron and Steel institute at their regular meeting Sept. 20 will accept the resignation of Robert P. Lamont, president of the institute since Aug. 4, 1932, the day after he resigned as secretary of commerce in the Hoover administration.

Despite rumors naming a number of prominent personages, it is said in New York that the post may not be permanently filled for the present. Charles M. Schwab, who became chairman of the institute when Mr. Lamont was made president, will nominally act as president.

The chief burden upon the institute at this time is the acceptance of schedules of prices, new extras and differentials, and other adjustments occasioned by the steel code. Presiding over these changes are five committees—administrative, labor, statistics, commercial and transportation—which can function practically automatically.

Administrative Group at Helm

The active direction is expected to fall chiefly upon the administrative committee, of which W. A. Irvin, president, United States Steel Corp., is chairman. Other members of this committee are: E. G. Grace, Bethlehem Steel Co.; Tom Girdler, Republic Steel Corp.; L. E. Block, Inland Steel Co.; Hugh Morrow, Sloss-Sheffield Steel & Iron Co.; E. T. Weir, National Steel Corp.; and W. J. Filbert, United States Steel Corp.

Mr. Lamont's letter of resignation, addressed to Mr. Schwab, confirms rumors current for several weeks. Although the letter was only made public Sept. 13, it was dated Sept. 1, or three days following the last meeting of directors on Aug. 29, the deadline for filing prices under the code.

Mr. Lamont's reasons for resigning were summed up in the concluding paragraph of his letter in which he stated.

"The opportunity for constructive, forward-looking studies and plans for the industry as a whole that seemed possible a year ago must give way to the present practical immediate demands which can best be met by men familiar with the vast details of the various branches of the industry. I can be of little help in this work."

Pending the selection of a successor, additional duties are expected to accrue to George H. Charls, assistant secretary of the institute.

Without an active head and under the guidance of its committees, the institute continues to function at high speed in order to clarify the many complications bred by the new code. Meetings of the commercial committee were held Sept. 12, and of the executive committee Sept. 13.

Official approval of price schedules may be given this week at the meeting of directors.

ROBERT P. LAMONT

Who resigns as president of the American Iron and Steel institute

New schedules filed in the past week included a revision of extras on mixed and joint carloads of wire products, and new extras for processing wire products. The extra for special galvanized wire is now 25 cents for No. 14 gage and coarser, compared with 35 cents formerly. There are now size differentials for Nos. 19 and 20 gage, where formerly there was none above No. 18 gage.

Four quantity differential brackets are provided in new discounts on hot and cold-rolled seamless boiler tubes.

First withdrawal of prices, which led to much speculation, was that of eastern producers of bars, plates and shapes.

In the NRA parade of 250,000 marchers in New York Sept. 13, the largest civilian parade ever held in the United States, was an iron and steel division of which J. H. Osmers, of the United States Steel Corp., was marshal. The steel division included more than 500, largely recruits from the steel offices in New York, of which approximately 200 were representatives of the United States Steel Corp. and its subsidiaries.

The President Sept. 7 formally approved the code for the cast iron soil pipe industry, which specifies a minimum hourly wage of 40 cents in the North and 32 cents in the South, with a work week of 27 hours for plant labor and 40 hours for clerical and office forces.

A hearing on the code submitted by can manufacturers will begin Sept. 20 in the senate office building in Washington before Deputy Administrator King. The proposed code fixes a 40-hour work week and minimum hourly rates of 30 cents in the North and 27½ cents in the South and in Hawaii.

The code submitted by the valve and fittings manufacturing industry, also setting up a 40-hour week and a general minimum hourly rate of 40 cents, will be heard Sept. 18 at the Willard hotel in Washington.

NRA is distributing proposed codes submitted by the malleable iron, steel joist, steel warehousing and open steel flooring industries. Hearings on these have not yet been set.

Lamont's Letter Of Resignation

Mr. C. M. Schwab,
Chairman, Board of Directors,
American Iron and Steel Institute,
New York, N. Y.
Dear Mr. Schwab:

At my first meeting with the Executive Committee of the American Iron and Steel Institute in September a year ago, I read a brief statement, two paragraphs of which were as follows:

* * *

"I have assumed that your purpose in enlarging and broadening the scope of the work of the Iron and Steel Institute is primarily the practical one of getting and keeping the industry on a sound and profitable basis insofar as this can be brought about by co-operation between the various units—within the law.

"I assume also that in addition to this, the reasons for making these changes are related—not so much to conditions growing out of this depression, but rather to the more fundamental difficulties affecting all industries which, if not worked out within or by the industry itself, will in the end bring about changes in existing laws and a greater measure of governmental control than most of us would like to see."

* * *

A few suggestions were made as to how a beginning might be made in enlarging the activities of the Institute.

But conditions in the industry were bad and getting worse. Executives were naturally concerned with immediate, pressing problems. Monthly losses were increasing and accumulating. Final losses for the year amounted to more than $150,000,000.

A momentous national election was approaching. The result foreshadowed important changes in governmental pol-

icy, but, unfortunately, a four months' interval of uncertainty intervened before the new administration could function. Meanwhile prices continued to decline, industrial activity reached new low levels, banks were failing everywhere. Inaugural week saw the country industrially and financially prostrate, and the morale of the people at the lowest point of the depresion. A special session of Congress was convened. Various relief measures began to be discussed; among others, the six-hour day and five-day week bills which were later replaced by measures which finally took form in the National Industrial Recovery Act. This was signed by the President on June 16th. Work had already begun on a Code of Fair Competition for this industry, which was completed and presented to the Administrator of the National Recovery Act on July 15th. A public hearing was held on July 31st and the Code was approved on August 19th.

On August 29th the Board of Directors held its first meeting in its capacity as Administrator of the Code. Three representatives of the National Recovery Administration attended the meeting, marking the beginning of government regulation of business. No one knows how far it may go.

From now on, for an indefinite period, the principal activities of the Iron and Steel Institute will be in seeing that the obligations of the industry under the Code are properly carried out and reported to the Government.

The opportunity for constructive, forward-looking studies and plans for the industry as a whole, that seemed possible a year ago, must give way to the present practical, immediate demands, which can best be met by men familiar with the vast details of the various branches of the industry. I can be of little help in this work.

I, therefore, hereby tender my resignation as President of the American Iron and Steel Institute, to be effective at your earliest convenience.

In leaving, I should like to express to you personally, Mr. Schwab, and to all members of the Board, my deep appreciation of the thoughtful, friendly consideration which I have received throughout a difficult and trying year.

Yours truly,

ROBERT P. LAMONT.

Index to Steel Code Data

FOR the ready reference of readers, STEEL *presents an index to the price, extra and other data promulgated for various branches of the iron and steel industry in conformity with the industry's new code, which was published in annotated form in the issue of Aug.* 26:

Product	*Page and Issue*
Alloy base prices	p. 15, *Sept.* 4
Bars, classified	p. 12, *Sept.* 4
Bars and small shapes	p. 13, *Sept.* 4
Bars, concrete	p. 13, *Sept.* 4
Fencing, woven wire	p. 15. *Sept.* 11
Jobbers, Pacific coast	p. 15, *Sept.* 11
Jobbers' status clarified	p. 16, *Sept.* 11
Pig iron	p. 16, *Sept.* 4 and p. 14, *Sept.* 11
Plates, classified	p. 12, *Sept.* 4
Products in indirect export	p. 15, *Sept.*11
Semifinished steel	p. 15, *Sept.* 4
Shapes, structural	p. 12, *Sept.* 4
Sheets, classified	p. 12, *Sept.* 4
Sheets, cold-rolled	p. 13, *Sept.* 11
Sheets, extras modified	p. 12, *Sept.* 11
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Strip, hot rolled	p. 14, *Sept.* 4
Strip, hot-rolled, rolling and cutting tolerances	p. 14, *Sept.* 4
Switching charges at Gulf and Pacific ports	p. 15, *Sept.* 11

Steel Corp. Adjusts Wages

Certain departmental adjustments in wages are being made in plants of the United States Steel Corp. Increases, in varying amounts, are being granted some wage employes in order to conform to provisions of NRA. There is no blanket wage increase. Adjustment has been made necessary, for example, in some departments where weekly work hours have been scaled down to from 50 to 60 to a present 40 hours maximum.

150 Attend Detroit Iron, Steel Club Outing

The Iron and Steel Club of Detroit drew an attendance of 150 members, mill officials and purchasing executives of Detroit at its first annual outing held at the Indianwood club, Lake Orion, Mich., Sept. 9.

Following an afternoon of golf, in which R. N. Watson, of the Watson Stamping Co., registered the lowest net score, a dinner was given.

A. J. Bopp, Bopp Steel Corp., president of the club, designated Henry Roemer, president, Sharon Steel Hoop Co., Sharon, Pa., as toastmaster.

Addresses were made by W. S. Knudsen, president, Chevrolet Motor Co.; Frank R. Frost, president, Superior Steel Corp., Pittsburgh, and Abner Larned, Detroit, chairman of the Michigan NRA.

W. J. Clucas, of Edgar T. Ward Sons' Co., secretary-treasurer of the club, was general chairman of the outing committee. C. A. Poxson, district sales manager of the Newton Steel Co., Detroit, who is vice president of the club, was chairman of the attendance and publicity committee.

H. N. Arbuthnot was chairman of the entertainment committee, E. M. Vehmeyer of the golf committee, H. B. Miller of the prize committee and A. A. Keally of the reception committee. More than a score of prizes were distributed.

Fix Upset Prices on Empire Steel Corp. Plants

Upset prices for the various units of the Empire Steel Corp., Mansfield, O., ordered sold to the highest bidder by Federal Judge S. H. West. of Cleveland, have been decided as follows:

Mansfield, O., $600,000; Ashtabula, O., $110,000; Cleveland. $147,000; Niles, O., Falcon, $285,000; Niles, O., Thomas, $90,000; Niles, O., Waddell, $40,000.

C. M. Henkel, Mansfield banker, has been operating the corporation since it was thrown into receivership in May, 1931, by the Interlake Iron Co., Cleveland, a creditor. Mr. Henkel will continue to operate until a sale is made.

A reorganization committee headed by Frank A. Scott, Cleveland attorney, is expected to bid in the plants.

JAPAN RAVENOUS FOR AMERICAN SCRAP: Of the 355,354 *tons of iron and steel scrap exported from this country in the first half of* 1933, *by far the largest share went to the Nipponese, with Italy and Poland in second and third places. At one time recently, Japanese agents had* 100,000 *tons bought up awaiting shipment. Shipments are being made through Atlantic and Pacific coast ports, the illustration showing a portion of* 6000 *tons being loaded aboard the Japanese vessel* VENICE MARU *at Long Beach, Calif.*

WINDOWS OF WASHINGTON

WASHINGTON

CODES continue to be heard and approved and General Johnson almost daily over the radio barks out his appeal for consumer support of NRA, but the spotlight of the administration's recovery program unmistakably is shifting to the White House.

An air of disintegration is settling over NRA headquarters. Fewer big business men are frequenting it, and those who were attracted to its staff are reported chafing over their short tether. A marked decline in morale is evident.

Secretary of Commerce Roper is openly visualizing the time when his department takes over the permanent features of NRA, chiefly the regulation of industry. Even General Johnson, patently a tired man, refers to a reorganization of NRA, presumably without himself.

Meanwhile, as the general attempts to maintain enthusiasm for a program which requires the zeal of a holy war for success, the President has begun talking of new and more definite helps to business, many of them unrelated to NRA.

The President has conferred with Railroad Co-ordinator Eastman on a purchase of rails by the railroads and will dicker with the mills for a lower price. He is interesting himself in the public works administration.

The President is considering RFC loans to industries for payroll purposes when local banks cannot or will not grant accommodation. It is now being said at the White House that stimulus is needed for the purchase of capital goods. And talk of the President using his permissive powers for inflation is gaining currency so fast that inflation promises to eclipse NRA.

THIS crowding of General Johnson off the front page is to the liking of the President's intimate advisers. It also, in some quarters, is believed to be due to growing apprehension over the business situation. The

Roosevelt Eclipsing Johnson

♦ ♦ ♦

Steel Must Look to Tonnage

♦ ♦ ♦

Navy Is for Stainless Steel

sharp decline in the production of steel, for one thing, is causing alarm.

NRA, or more specifically the blue eagle division of it, is not fading precipitately out of the recovery picture, but its effectiveness has not been up to expectation and many close to the President believe the time has come to give business "the needle." This is some form of inflation, with the direction coming from the President instead of General Johnson.

Almost daily some evidence crops out that important members of congress are converts to inflation. It is only four months to Jan. 20, when congress convenes, sentiment for inflation in order to aid the debtor class is spreading, and the only defense of the President for not using his permissive powers will be a flourishing state of business.

No less a leader than Senator Pat Harrison, of Mississippi, has come out for modified inflation. Some members of congress have virtually served notice that if the President does not exercise his permissive powers congress will make them mandatory. At the next sesion, President Roosevelt may get a taste of what former President Hoover was up against on Capitol Hill.

Only those in the inner councils could prove it, but Washington, which has a highly-developed sixth sense, believes there is a realization that NRA has had a tendency to repress instead of develop business, and that whatever natural comeback was in process has been checked and will not reappear until the artificial barriers have been removed.

As has been stated before in this column, organized labor has overplayed its hand. It won a signal victory in congress, and in attempting to repeat the performance in NRA, against General Johnson's better judgment, it cost NRA the badly-needed confidence of business.

Washington has seen heroes before, and knows that the only way off a pinnacle is down. The pinnacle of NRA to the popular mind was when the steel code was adopted, although there is increasing evidence that the steel industry got more than it gave.

THE President, it is believed, has a different concept of inflation than when he first entered the White House. It is in congress rather than the President that the real danger of inflation lies.

Congress veers toward currency inflation, of which the Garner plan—being revived—for loaning several billion dollars direct to manufacturers and industrial merchants is typical. This was the program which Mr. Hoover charged would make the government a pawnbroker.

The President, on the other hand, appears a convert to credit expansion or inflation. This is evidenced by the RFC proposal to loan a billion dollars to banks, trust companies and mortgage companies for reloaning to finance material purchases and payrolls. This, in effect, is another attempt to force money out into industry. In other phases, it was tried unsuccessfully by the Hoover administration. Washington wonders if changing conditions may inspire greater success at this time.

An economist who has entree to the inner circle in Washington points out that inflation is greatly misunderstood. It is generally assumed to be of enormous assistance to the debtor class, whereas the usual effect is to raise prices all around and the only difference is that the counters are larger.

Creditors and debtors are not two distinct classes, this economist maintains. Most debtors own life insur-

ance policies and some securities and have bank accounts, which automatically make them creditors. Hence inflation in a broad sense is a transfer from one pocket to another.

What is not realized, declares this economist, is that debts are paid not with prices but from income, and income is the spread of receipts over expenditures. Inflation raises a producer's costs as well as his selling prices, and hence there is no gain.

Nor is debt, which inflation seeks to lessen, a crime. In fact, this economist points out, debts are largest in times of prosperity when manufacturers and merchants borrow heavily to finance their operations.

The burden of debt is its service, and this service must be paid for out of income.

THIS line of reasoning on inflation has a corollary in prices. Increasingly economists in Washington are saying that the heavy industries must not increase their prices, but must look to volume or tonnage.

The heavy industries, it is contended, have not lowered their prices in step with others. Building, for one thing, is believed to be held back by the comparatively high price of steel and other materials.

The index of the bureau of labor statistics, which incidentally is undergoing some revision, shows that all commodities declined in price 31.7 per cent from June, 1929, to June, 1933.

Metals and metal products, however, came down only 21.6 per cent during this period. Building materials eased off only 21.5 per cent, and chemicals and drugs 21.1.

On the other hand, the drop in farm products was 48.5 per cent, foods 38.3, fuel and lighting materials 27.2, textile products 31.7.

The statement is made by one high in authority that steel has handled its price situation less intelligenlty than most other industries. Also regarded as backsliders are the railroads, for increasing rates and imposing a surcharge in depression.

The theory in Washington is that tonnage will whittle down overhead and other fixed costs of producing iron and steel and enable it to reenter "the black," whereas higher prices would only frighten business.

This line of reasoning apparently does not take into account the fact that iron and steel prices did not go as high as some other commodities in 1929 and hence a lesser adjustment is required now.

THERE also is some opinion, no longer concealed, that it would have been best to have let business sink to the bottom as rapidly as possible after the stock market debacle of October, 1929.

This would have enabled the country to take its deflation in one large dose, by late 1930 business might have been on its way back with corporate treasuries in good shape, and the enervating experiences of the past four years might have been avoided.

There is one authority who states that, from hindsight, the country would have been better off without any reserve system or RFC or other agencies. These probably prevent four out of five panics, of which the country generally is unaware, but when the fifth comes they intensify it.

"But," this authority concedes, "in a similar situation the procedure would be duplicated. When a member of a family is ill no effort is spared, even though the prospect is hopeless. In an ideal community deflation—if it crept in—might be liquidated at once, but it was only natural to fight a defensive action against it."

HAVING in mind the keen interest of Japan, Great Britain, France and Italy in naval design, the navy department is mum as a clam on the extent to which it will utilize stainless steel in its 32-ship program.

But this much can be said, that never before has this type of steel been used in such quantity and for so many services. It is believed that submarine masts, smokestack uptakes, deck houses and certain valves and fittings are being specified for stainless steel.

To the navy, this type of steel is an especial boon because lightness without sacrifice of strength permits the construction of a larger ship for a given limitation on tonnage.

Of course, the conflict of salt air and steel is unceasing, and lower maintenance also is an objective.

For these 32 vessels, the most ambitious naval program since the World war, the official estimate of the navy department is that 100,000 tons of steel will be required. Unofficial estimates were that the tonnage of plates and shapes would be 75,000 to 80,000, leaving about 20,000 for boilers, turbines and equipment.

SECRETARY ICKES, continuing to speed public works projects, has set up a board of 12 to be known as the Federal Emergency Administration of Public Works Technical Board of Review to arbitrate when projects are protested. Col. Carey H. Brown, army engineer and more recently with PWA, is chairman.

Cast iron pipe manufacturers note with joy an allotment of $250,000 to Eau Claire, Wis., for construction of waterworks improvements, including new wells, four small pump houses, a new reservoir and additional lines.

First start on slum clearance is visualized with a loan of $12,000,000 to Cleveland, contingent upon the sponsors raising $2,000,000. The Cleveland suburb of Euclid receives $1,000,000 for a similar project.

Other PWA awards include $6,164,050 for Indian projects, $2,279,474 for park roads and buildings, $2,273,671 for 22 postoffices and hospitals.

FOR the first time since a group of manufacturers joined forces to modify provisions of the recovery act, when congress was considering it, industry is presenting a united front in similar fashion to organized labor.

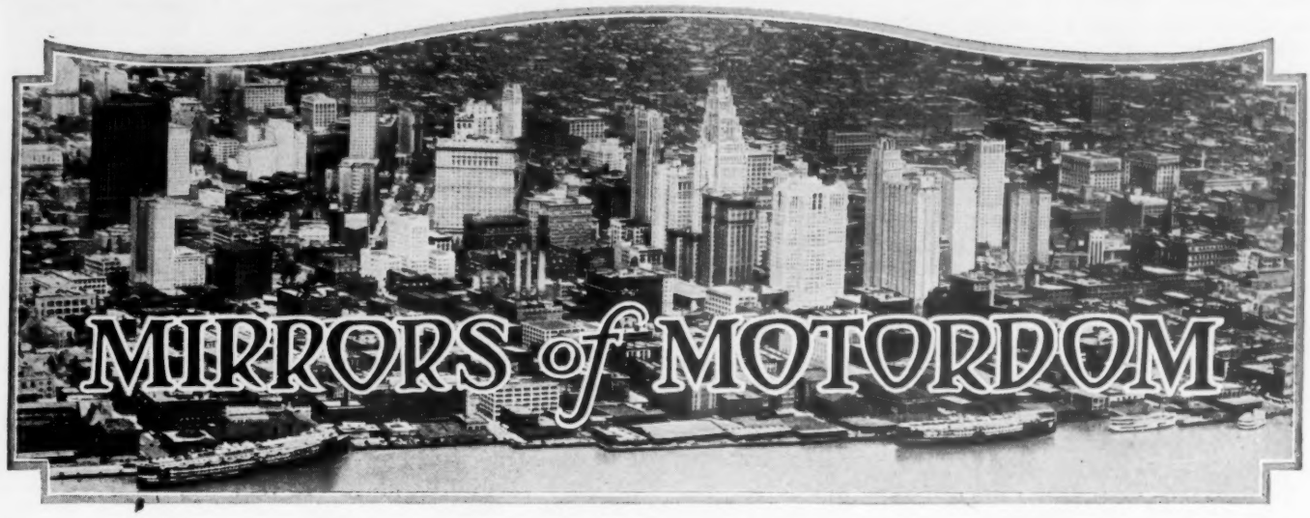
This group, known as the Employers' Advisers Committee on Codes of Fair Competition, in effect is the bulwark of industry against the American Federation of Labor and its allied forces. It is claimed that 50,000 major units of industry are represented.

John L. Lovett, of the Michigan Manufacturers' association, has been set up as chairman, with headquarters in the Investment building, Washington. Associated with him are: Paul C. DeWolf, Brown & Sharpe Mfg. Co., Providence, R. I.; Charles R. Hook, American Rolling Mill Co., Middletown, O.; Thomas Pangborn, Pangborn Mfg. Co., Hagerstown, Md.; R. S. Shainwald, Paraffine Co., San Francisco; George H. Houston, Baldwin Locomotive Works, Philadelphia; Harold C. Smith, Illinois Tool Works, Chicago; Philip Morgan, Morgan Construction Co., Worcester, Mass.; H. M. Taliaferro, American Seating Co., Grand Rapids, Mich., and Roy Wantz, Rockford Fibre Container Co., Rockford, Ill.

PRESSURE continues to be exerted on RFC for loans for financing Russian business and some important developments on the Russian situation may be approaching. . . . While the government is promoting NRA, navy yards which formerly were working 5½ days a week and paying for 6 days have reduced to a schedule of 5 days work and 5 days pay. . . . John L. Lewis, president of the United Mine Workers, is proving the strong man of the American Federation of Labor, with friends proposing him for president at the Federation convention which opens Oct. 2. . . . The departments of labor and commerce, federal trade commission and other agencies are notifying industry that reports to them must be continued regardless of reports now also required by NRA.

Trade Name Is Changed

Because of similarity of the name Dascoloy to the name of another trademarked alloy, the Detroit Alloy Steel Co., Detroit, has decided to change the name from Dascoloy to Krokoloy, and hereafter its leading chrome-cobalt alloy tool steel cast to shape will be known by the latter name.



DETROIT

FOR an accurate appraisal of the automobile situation, these three factors must be considered:

Assemblies, while declining moderately, continue seasonally strong, and the outlook for a good fall is bright.

Contracts for materials are being fully specified, chiefly for current consumption but also for stocking where the nature of the material permits and the price is right.

Fresh commitments for materials are negligible, partly due to code and other market uncertainties but also because expiring contracts are adequate for completing runs on 1933 models and plans for 1934 models, in most cases, are not yet complete.

To what extent NRA has generated buying power is difficult to determine, for the industry itself has been driving hard on sales, but enthusiasm is in high gear and retail selling is mowing down obstacles.

For deliveries to be delayed is unusual for September, yet Chrysler is short of some lines. Graham, to mention another, intended "pulling" the dies for its current series but has decided to make 800 more.

The situation is reflected in factory production.

Actual output of passenger cars and trucks in July was 233,088 units, about 20,000 down from the June peak. The national automobile chamber of commerce estimate for August is 171,145 plus about 50,000 for Ford, or a total of over 220,000 units.

For September, Chevrolet will turn in 60,000 units, Pontiac 6000 and other subsidiaries sufficient to make the General Motors total 75,000 units. Chrysler is assembling 35,000 Plymouths, 16,000 Dodges and enough DeSotos and Chryslers to give it an aggregate of 55,000 to 57,000 units. Ford is little changed this month at slightly more than 50,000.

Thus, these three leaders are staking September to upward of 180,000 cars, and indications are that the rest of the industry will put the month close to 200,000. By contrast, a year ago production was sliding from 90,352 in August to 84,150 in September to the alltime low of 48,702 in October.

Production Seasonally Heavy

• • •

Steel Price Rise $10 a Car

• • •

Chrysler Expanding Schedule

DESPITE the fact that it wrote the so-called merit clause into its code, where other industries failed, the automotive industry is apprehensive of labor trouble.

When the branch assembly plant of one of the larger manufacturers laid off several hundred men, due to a curtailment of orders, union officials took the matter to Washington and made an issue of the union men who were let out. It happened that this branch was about 50 per cent unionized, and this percentage of union men was in the layoffs.

Detroit has always entertained the mild suspicion that the occasional shutdowns of the Ford Motor Co. were in part an effort to weed out undesirable agitators, and what will happen if this is attempted again is interesting conjecture.

As a rule, automobile manufacturers are paying a few cents per hour over the minimum specified in the code. Manufacturing schedules at present are proceeding without undue application of the 35-hour week, and some schedules are over 40 hours a week.

Under the code, hours are to be averaged over the four months September to December, and the shutdown in November for the changeover to new models will supply an offset to the present overage.

Of the many industries contributing materials to the assembly line, the textile one appears hardest hit by the codes; difficulties are experienced obtaining the right fabric at the right time.

HENRY FORD having returned from his camp in upper Michigan and his policies being as illusive as his personality, anything may happen in regard to the Ford Motor Co. and the automobile code. But the chances are that he will play a waiting game, and the onus for any action will be up to General Johnson.

There appears to be no intent of the Ford company to pay less than the minimum of 43 cents per hour or to work its employes longer than an average of 35 hours per week. It is the compulsory monthly reports to the national automobile chamber of commerce that do violence to the "lone wolf" spirit of Mr. Ford.

Thus far it has hurt the Ford company not to fly the blue eagle. Some cities and states have boycotted its product. Below the Mason and Dixon line, where sentiment for President Roosevelt amounts almost to a religion, Ford sales are understood to have fallen off badly. In California there has been some talk of denying registration to Fords. On the other hand, the low bid of Ford for 99 city cars for Detroit has got the business. Hiring 5000 World war veterans will not hurt Mr. Ford with the country.

Some men in Detroit who usually read events correctly believe the Ford case will be the undoing of NRA and topple public sentiment against it. For the United States government to talk of boycotting a company because it will not actually subscribe to a document, even though bettering its demands, is repugnant to many here. At heart the automobile industry never was enthusiastic for NRA, and today it is less so.

Many persons are saying that for the first time they can agree with Henry Ford on something. At the same time, with solicitude for Detroit's largest industry, they deplore

the fact that Henry Ford was secluded in Michigan and Edsel Ford was vacationing in Maine during a crucial period for the automobile industry, when his competitors are putting the last ounce of pressure in their retail campaigns.

PURCHASING agents generally are not openly discussing the new steel prices, filed under the steel code, and are not making fourth quarter commitments, although in isolated instances they have paid the full, new prices for small emergency requirements.

It is estimated that the application of the full market price plus the restoration of full extras and differentials will raise the cost of steel about $10 per ton. This figure would also represent approximately the increased cost of steel per car.

In the past, many purchasing officials have maintained that they were concerned less with a low price as such than with the possibility that their competition might be paying less. The new single price basis affords a test of this attitude.

Actual new business placed the past week was less than in the comparable period of March, when the bank holiday blackened the situation. It is apparent that several weeks will elapse before action is taken on needs for new models.

One effect of the new price system will be the elimination of small fill-in orders for mills. Last week on one lot of 1000 pounds an automotive buyer had to pay an $8 quantity extra. On emergency lots that have been trucked, the buyer now must pay for the trucking, yet get a credit of only 65 per cent of the carload rate.

CHRYSLER continues to buttress its title of being the most aggressive unit of the industry. It has placed between 50,000 and 75,000 tons of steel —and other materials in proportion— for prompt delivery in order to assemble as rapidly as possible its estimated car needs for the remainder of the year.

This means that its October schedule will be heavier than the September one in most divisions. Also, that the introduction of its 1934 lines will probably be later than might have been expected earlier in the fall. In fact, most manufacturers want to produce their present lines so long as they sell well, inasmuch as they can get most materials at pre-code prices and have the opportunity to ascertain the effect of the code on labor costs.

Chrysler may bring out something new in frames next year—a tubular frame which would also serve as a conduit for all cables, wires, lines, etc. Chrysler has awarded Budd a contract for 300,000 pressed steel wheels for 1934 delivery.

Because the tentative Ford schedule for October is about half the 50,000 or more for September there is some reason for believing a changeover in models late next month is a possibility. New Ford engines in experimental bodies are being tested in various parts of the country, and their speed is said to exceed the present V-8.

Incidentally, instead of reconditioning his engine the owner of a V-8 can exchange his engine for a factory rebuilt one for $40. The same deal for a Model A or B engine costs $37.50.

A faction in Hupp stockholders strongly believes that the company should get into the low-price field, but so long as the present management is in the saddle this does not seem probable, despite the recent rumor that Hupps in the $500 class are near. Attempts have been made to design a low-price car, but the strain of quality has been too strong. For much the same reason, Buick engineers found it impossible to lower their standards, and their Marquette model did not last long.

At the annual Hupp stockholders' meeting in Richmond, Va., Wednesday the present management, headed by Dubois Young, president, was upheld, and this may be a further indication that the present policies and price class will be continued.

Hupp, however, is understood to have designed a teardrop body which approaches true streamlining more closely than any car now on the market with the possible exception of the Pierce "golden arrow." If the decision to put it in production is made, the base price will be about $1000.

PIERCE - ARROW having broken away from Studebaker, the "shotgun" marriage of Studebaker and White is reported to be nearing annulment. . . . Willys has court sanction to assemble 2500 trucks and 2000 engines for International Harvester, and is expanding its force. . . . Gulf Refining Co. continues the largest buyer of trucks, and closed recently on another large lot. . . . Murray is now making 1500 steel beer barrels daily. . . . Retail sales of Hudson and Essex cars in the week ended Sept. 2 were the largest for any week since July, 1931.

89.3 Per Cent of Cost of Plant Goes for Labor

Statistics compiled by the Austin Co., engineer and builder, Cleveland, show that 89.3 per cent of the actual building and equipment cost in a recent construction job of the company went for wages.

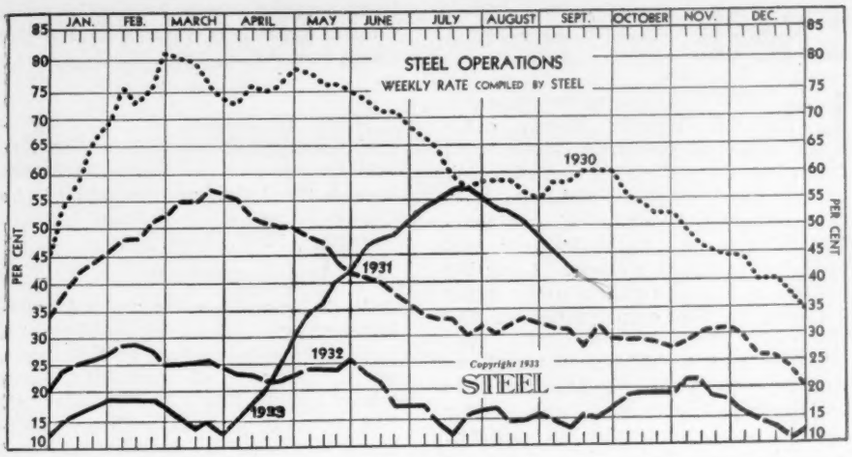
The total actual cost of the structure and the manufacturing equipment was $450,000. Of this amount, $402,280 went for wages, representing 805,310 man hours, or more than 100 days' work of eight hours for 1000 men.

Actual cost of basic raw materials used in the structure and in the manufacturing equipment was figured at only $39,300, when they were reduced to minerals in the ground or standing timber. For converting these raw materials into finished products, it is estimated that $250,370 was paid to unskilled and skilled labor in scores of plants throughout the country with practically every section feeling the impetus directly. An additional $84,410 was paid labor in the plant erection, $17,500 went to labor in transportation, and $50,000 to labor for the installation of plant equipment.

Actual cost of building		$250,000
Actual cost of equipment		200,000
		$450,000
	Wages	Man Hours
Building Labor at Job:		
Common labor	$ 5,060	10,200
Cement workers	10,000	19,800
Bricklayers	11,400	12,800
Steel erectors	4,260	3,310
Carpenters	8,030	10,800
Sash erectors, glaziers	8,300	8,300
Painters	2,110	2,650
Plasterers	440	620
Roofers	4,400	5,830
Plumbers	15,400	15,400
Electricians	6,170	6,170
Bldg. organization	3,540	3,540
Engineers	5,300	4,240
Total	$ 84,410	103,660
Labor on Materials at Source of Supply:		
Concrete	$ 18,200	40,410
Brick	5,000	12,700
Steel	20,100	50,800
Carpentry	16,100	39,800
Sash and glass	6,700	42,300
Paint	600	1,500
Roofing	9,500	23,800
Plumbing	37,400	92,000
Lighting	6,350	15,900
Miscellaneous	420	840
Total	$130,370	320,050
Transportation	14,920	
Actual Materials (basic)	20,300	
TOTAL COST OF BUILDING	$250,000	
	Wages	Man Hours
Plant Equipment:		
Monorails, cranes, power wiring, motors, pipe lines, lathes, shapers, planers, punches, presses, racks, electric trucks, conveyors, furnaces, dies, patterns and bins		
Labor at Job	$ 50,000	62,500
Labor on Materials at Source of Supply	$120,000	290,000
Transportation	11,000	
Actual Materials	19,000	
Total Cost of Equipment	$200,000	

Offers Roll Design Course

Carnegie Institute of Technology, Pittsburgh, will give a course in its night school this year in steel mill roll pass design, said to be the first of its kind and open only to men in the roll business. Prof. W. Trinks, author of two books on roll pass design, will teach the class.



Steel Rate Decline Held to 1 Point; 4 Districts Improve

FOUR important operating districts advanced their steel production rate last week, due to specifications against third quarter contracts, and they held the decline in the national steel average to 1 point, making the rate 41 per cent.

These four districts were Lorain, Cleveland, Youngstown and New England.

In the Wheeling, Birmingham, Pittsburgh and Detroit districts there were no changes. At Buffalo, Chicago and eastern Pennsylvania there were losses ranging from 2½ to 5 points.

The outlook for this week is for little change. Details of various districts follow:

Chicago

Steelmaking operations declined 5 points the past week to 40 per cent, principally as a result of a reduction of schedules by one interest. While backlogs still are being reduced, new business is slightly more active and a halt in the recent downward trend in production is seen for the near future. Two more blast furnaces have been banked, leaving seven of the district's 36 steelworks stacks active.

Youngstown

Steel output last week was up 1 point to 46 per cent and was expected to start this week at that point. The buying bulge of several days ago is slowly tapering off, but an upswing in the last part of September is looked for. Forty of 83 open-hearth furnaces are melting.

Detroit

Great Lakes Steel Corp. continues to operate its six open hearths, while the ten Ford open hearths remain idle, giving this district an average of 55 per cent, based on capacity. The two new Great Lakes open hearths are expected to be ready in a little over a month.

Cleveland

Steelworks operations in the Cleveland-Lorain district advanced 4 points to 60 per cent as an average for the past week. This increase was due to requirements for finished steel to be shipped on expiring contracts before Oct. 1. At Lorain the National Tube Co. increased the number of its active open hearths from eight to ten. Otis Steel Co. advanced from six to seven, while the Corrigan, McKinney Steel Co. continued with seven.

Pittsburgh

After declining by successive weeks for over a month, steel production in this district leveled off last week and, at least for the time being, the decline was checked. Operations averaged 35 per cent for the district and this week likely will see a continuation of that figure. Individual rates in the plants here are largely unchanged with two leading interests operating at 34 and 45 per cent of capacity, respectively. Blast furnace rates are as follows: Three United States Steel Corp. subsidiaries here have 12 out of 38 blast furnaces on, Jones & Laughlin Steel Corp. 6 out of 11, Pittsburgh Crucible Steel Co. 1 out of 2, and Pittsburgh Steel Co. also 1 out of 2. At Johnstown, Pa., Bethlehem Steel Co. is blowing with 4 out of 7 blast furnaces. In the finishing mills, tin plate, wire products, sheets and strip, in the order named, are leading.

Wheeling

Steel production was unchanged at 75 per cent in this district last week. In the plants of three producers there were 25 out of a possible 37 open hearths running through last week. This week Wheeling district operations probably will continue at close to 75 per cent. Two of the inactive open

Operating Rate of the Steel Industry, by Weeks

All figures except monthly open-hearth and bessemer totals of American Iron and Steel institute are percentages, based on reports from Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Buffalo, Wheeling, New England, St. Louis, Lorain, Detroit districts. Weeks end Saturday. STEEL's weekly estimates take into account only actual available capacity, which is less than Institute's total.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	STEEL's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.....	22	25	26	27	28.5	25.7	1,484,991	26.41
Feb.....	28.5	27	25	25	....	26.4	1,481,253	27.40
March....	25	25.5	24.5	23	....	24.5	1,433,337	24.55
April.....	23	22	22	23	24	22.8	1,259,629	22.40
May.....	24	24	25.5	23	....	24.1	1,125,243	20.01
June.....	21	17	17	17	....	18.0	912,757	16.23
July.....	14.5	12	15.5	16.5	16.5	15.0	806,722	14.92
Aug.....	14.5	14.5	15.5	14.5	....	14.7	846,730	14.50
Sept.....	13.5	15.5	15	17	....	15.3	991,858	17.64
Oct.....	18	19	19.5	19.5	19.5	19.1	1,087,058	19.33
Nov.....	21	21	19	17.5	....	19.6	1,032,221	18.36
Dec.....	16	15	14	12	13	14.0	861,034	15.31
1933								
Jan.....	15.5	17	18	19	....	17.4	1,030,075	18.23
Feb.....	19	19	19	17	....	18.5	1,086,867	20.83
March....	15	13.5	15	14	15.5	14.6	909,886	15.50
April.....	17.5	20.5	25	29	....	23.0	1,362,856	25.08
May.....	33	36	40	43	....	38.0	2,001,991	34.11
June.....	47	48	49	51	54	49.8	2,597,517	45.96
July.....	55	57	57	55	....	55.8	3,203,810	58.95
August....	54	54	51	48	45	50.6	2,900,611	49.42
Sept.....	42	41	..	..	....	....	.....	.....

hearths inactive at present are of over 200-ton capacity and are down for repairs.

Eastern Pennsylvania

Steelmaking capacity has been taken off to the extent of reducing operations in the central eastern seaboard district 1½ points to 35-36 per cent. New business is at a virtual standstill, hence a further reduction in operations is probable.

Buffalo

Steel operations slipped 3 points last week to 45 per cent. So far as can be foreseen, this rate will hold this week. Seventeen open hearths are scheduled for this week.

New England

Ingot operations advanced to the 96 per cent rate as predicted last week, but will drop back to 86 per cent this week. Two steel works continue to operate full.

Birmingham

Steelmaking continues unchanged at 50 per cent. No important improvement is expected until the rail mill at Ensley, Ala., again runs.

Percival Steel Marking Fifty Years of Business

Percival Steel & Supply Co., 4600 Santa Fe avenue, Los Angeles, is celebrating its fiftieth anniversary this month. The company started business Sept. 1, 1883, in the first brick building in Los Angeles as Percival & Merrill. The company now occupies a plant on a site of more than two acres. J. Percival and S. I. Merrill founded the company as a supply source for wagonmakers and blacksmiths, the original partnership agreement in longhand still being in possession of the company. It became Percival & Chambers after a short time and in 1898 was incorporated as the Percival Iron Co. In 1920 Emanuel Jungquist, its present president, entered the firm and after reorganization it was expanded to include steel, heavy hardware and many accessories. In 1925 the name was changed to the present firm style and construction of the present plant was started. This represents an investment for site, buildings and equipment of $300,000. Formal opening of the new plant took place in 1926.

Sturgis Co. Buys Curly

Curly Head Brush Co., 35 Lewiston avenue, Rochester, N. Y., manufacturer of wire brushes and other wire products, has been taken over by the Sturgis Mfg. Co. Inc., Rochester, recently incorporated, of which B. F. Sturgis is president. Operation of the plant will be continued.

Died:

L A. VINCENT, 38, sales manager, Swindell-Dressler Corp., engineer and manufacturer, Pittsburgh, Sept. 7 at Gary, Ind. He was educated at the University of Pittsburgh, taking a degree in chemical engineering. He saw approximately 18 months service in France. After his return and discharge from the army he entered the employment of the American Dressler Tunnel Kilns Inc., of Cleveland, in 1920 as thermal engineer. In 1928 he became sales manager and vice president. After the consolidation of this concern with William Swindell & Bros. to form the Swindell-Dressler Corp., he retained the position of sales manager.

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Edward J. Dives, 50, president, Chantrell Tool Works, Reading, Pa., in that city, Sept. 2.

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Walter R. Schellhammer, 57, secretary, Hammon Iron Works, Warren, Pa., in Maple Springs, N. Y., Sept. 12.

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J. H. Olcott, for 25 years in the sales department of the Waterbury-Farrell Foundry & Machine Co., Waterbury, Conn., in that city, Sept. 5.

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Hans Pederson, for 40 years one of the leading steel construction contractors on the Pacific coast, in Seattle, Sept. 7.

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Arthur C. Newby, 68, pioneer chain and bicycle manufacturer and later engaged in automobile manufacture in Indianapolis, in that city recently.

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Guerdon L. Brewster, 50, secretary, Chicago Hardware Foundry Co., North Chicago, Ill., in Waukegan, Ill., Sept. 6.

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Robert S. Carroll, 36, former president, Carroll Foundry & Machine Works, Bucyrus, O., in that city, Sept. 1.

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Morris Block, 62, president, Wisconsin Iron & Metal Co., Oshkosh, Wis., Sept. 9. He was born in Russia and came to the United States in 1888.

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Robert E. Degnan, president, Mexican Mining & Smelting Co., New York, in that city, Sept. 9. He was a member of the American Institute of Mining and Metallurgical Engineers.

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Walter S. Hutton, for years associated with the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., and later furnace superintendent for the Colorado Fuel & Iron Co., Pueblo, Colo., in Pueblo, Sept. 6.

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Harry H. Elmer, 65, former general manager of the Haines Automobile Co., and of the Globe Malleable Iron & Steel Co., predecessor of the Globe Forge & Foundries Inc., in Syracuse, N. Y., Sept. 13.

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A. S. Maxwell, sales and advertising manager for J. H. Williams & Co., New York, Buffalo and Chicago, at his home in Garden City, Long Island, N. Y., Sept. 9. Mr. Maxwell had been connected with the Williams organization many years and was widely known in the automotive, industrial, plumbing and pipe fields.

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Alexander Milne, 46, metallurgist, in Youngstown, O., Sept. 8. Since 1931 he was on the staff of the vice president in charge of operations, Republic Steel Corp. Graduating from Harvard in 1911, Mr. Milne joined the staff of the American Sheet & Tin Plate Co. at Vandergrift, Pa. Later he was with the Aliquippa plant of Jones & Laughlin Steel Corp. as chief metallurgist, and afterward was transferred to the general manager's staff at Pittsburgh with control of the metallurgical division of the tin plate and wire departments.

Oct. 21 is Steel Day at Century of Progress

Oct. 21 will be steel day at the Century of Progress exposition in Chicago, with the possibility that the fall meeting of the American Iron and Steel institute may be held in Chicago that day. The official committee, appointed by Robert P. Lamont, when still president of the American Iron and Steel institute, includes: L. E. Block, Inland Steel Co., Chicago; Frank Purnell, Youngstown Sheet & Tube Co., Youngstown; T. M. Girdler, Republic Steel Corp., Cleveland; Alexander Legge, International Harvester Co.. Chicago; C. D. Caldwell, Interlake Iron Corp., Chicago; Ralph H. Norton, Acme Steel Co., Chicago; and George E. Scott. American Steel Foundries, Chicago.

Schedules Inspection Trip

An inspection of the plants of the American Sheet & Tin Plate Co., Vandergrift, Pa., and Allegheny Steel Co., Brackenridge, Pa., is scheduled for the second day of the convention and steel exposition of the Association of Iron and Steel Electrical Engineers to be held at the William Penn hotel, Pittsburgh, Oct. 17 to 19.

Industrial Men in the Day's News

Ralph H. Watson, Vice President, United States Steel Corp.

AFFILIATED with United States Steel Corp. 31 years, he now is in charge of its manufacturing interests.

A NATIVE of Canada, he migrated as a boy to Boston and early became associated with metallurgical departments.

LOANED to the Tata Iron & Steel Co., India, as consultant, on return to Homestead his promotion was rapid.

FOR many years a leading metallurgist and steel plant executive, Ralph H. Watson should well fulfill the requirements of his new position as vice president in charge of the manufacturing interests of the United States Steel Corp., an appointment noted recently in STEEL.

Graduating from the Lawrence Scientific school of Harvard university, Cambridge, Mass., in 1900, he has been affiliated with the steel industry for 33 years, and for 31 years with the Steel corporation and its subsidiary, the Carnegie Steel Co., during which time the scope of his activities was constantly broadening.

Born in Harvey, New Brunswick, Canada, Jan. 7, 1878, he came to this country, to Boston, at the age of 10. He completed his preliminary schooling in that city, and made his first contact with the steel industry through the metallurgical department of the Maryland Steel Co., Sparrows Point, Md. Two years later, in 1902, he went to the Homestead, Pa., works of Carnegie Steel Co. as metallurgist's assistant. Later he was made metallurgist, second assistant superintendent and then superintendent of open hearths. While in this latter capacity he was loaned, so to speak, to the Tata Iron & Steel Co. in India, where he spent the winter of 1913-14.

Upon his return to Homestead he was appointed assistant general superintendent and, in 1928, general superintendent. On Sept. 1, 1930, Mr. Watson was chosen vice president in charge of operations of the Carnegie Steel Co., a position he occupied until his recent appointment, which has brought him to the headquarters of the Steel corporation at 71 Broadway, New York.

While having an unusually well-rounded experience in iron and steel metallurgy, Mr. Watson has devoted special interest to open-hearth practice. He went to India primarily as an open-hearth consultant, and has contributed technical papers on the subject, including one presented before the American Iron and Steel institute in 1928, a discussion of ingot molds.

In addition to the American Iron and Steel institute, Mr. Watson is a member of the British Iron and Steel institute, the Engineering Society of Western Pennsylvania, and the Harvard Engineering society, among other organizations.

He plays golf and fishes—but the emphasis is on fishing.

J RALPH PATTERSON has been appointed general manager of sales for the 130-year old Mackintosh-Hemphill Co., Pittsburgh, rolling mill engineer and builder. Mr. Patterson has had 20 years' experience, beginning in 1913 with the erection of steel mills, and transferring his attention to the making of mill equipment for the past 11 years with Mackintosh-Hemphill. He first was assistant and then manager of Adamite sales and more recently manager of roll and alloy casting sales. The company has produced nearly 1000 complete mills for steel, copper, brass, lead, tinfoil and aluminum industries throughout the world. It has plants in Pittsburgh, Midland, Pa., and Wooster, O.

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R. J. Crossett has been appointed sales representative for the National Automatic Tool Co., Richmond, Ind., in the Chicago district. Mr. Crossett will be associated with Dave L. Riley, manager of the Chicago office, 1908 Engineering building.

Walter F. Cahill has been appointed by the company as sales representative in the Detroit district. Mr. Cahill will be associated with E. A. Harper, manager of the Detroit office, 409 New Center building. He recently was associated with the Ex-Cell-O Aircraft & Tool Corp., Krueger-Wayne division, Detroit.

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E. L. Thearle has been appointed to direct the mechanical research section of the General Electric Co.'s research laboratories at Schenectady, N. Y., succeeding A. L. Kimball, who as announced recently in STEEL has

(*Please turn to Page* 50)

EDITORIAL

Tardily, Government Turns To Neglected Industries

FROM the very inception of NIRA until recently government officials have slighted the so-called capital goods industries. Throughout the high-powered drive to put men back to work and to improve their wages and working conditions emphasis has been placed upon the consumer goods industries.

There are several possible explanations for the government's apparent apathy toward the heavy industries. One is that the administrative chiefs thought that results could be obtained more promptly by encouraging the consumption of clothing, food, and other staples purchased out of wages by all of the people than by stimulating the demand for buildings and equipment, which are purchased out of capital by a limited number of individuals and companies.

Another reason is that official Washington has seriously underestimated the potentialities for increased employment in the equipment and building industries. Among the "social minds" are officials who fear the effect of installing machinery and productive equipment at this time. There are a few executives in Washington who believe that, during the period of unemployment, ditches for water mains should be dug with pick and shovel and iron ore should be unloaded from lake vessels in wheelbarrows. Apparently they can recognize employment in the spectacle of common laborers working in a ditch but they cannot visualize employment in the building of machines and equipment.

Inquiries for Equipment Dried Up When NRA Confusion Swept the Country

In fairness to some of the more level-headed administrators, as for instance General Johnson of NRA, let it be said that they have appreciated the power for employment in the equipment industries, but have felt it was necessary to get other things started before tackling the problem of the capital goods industries. Unfortunately, however, this policy has worked terrific hardships upon the manufacturers of machinery and equipment. Up to the time NRA became a factor in business, many companies were contemplating the purchase of equipment. With the advent of NRA and the uncertainties as to how much it would increase costs, most of these prospective purchasers withdrew their inquiries.

This additional shock, heaped upon industries which already had suffered much more than the consumer goods industries, may be disastrous for many companies unless improvement in business develops rapidly. Based upon the average for 1922-1924 of 100, the index of machine tool orders has been down in the twenties and thirties during most of the last two years. The index of foundry equipment orders has been down below 20 except for three months in the past year. With the average for 1923-1925 at 100, building construction has been hovering around 20 thus far this year. Against these deplorable showings in the building and equipment fields, the index of department store sales has averaged 55 to date in 1933 and that of chain store sales has averaged 117 in the same period.

This comparison suggests that in relation to normal business volume, unemployment must be far greater in the capital goods industries than in the consumer goods groups. Also it should be remembered that normally the capital goods industries employ more workers than the consumer goods industries.

Opportunity for Re-employment in Capital Goods Industries Has Been Neglected

Indicative of the distribution of work afforded by capital expenditure is the article, appearing elsewhere in this issue, which shows the items of labor and material in an industrial plant costing $450,000. Of this total, $402,280 or 89.3 per cent, represents the cost of labor. This is divided as follows: Building labor, $214,780; equipment labor, $170,000; and transportation labor, $17,500. In this case the equipment consisted of cranes and hoists, motors and electrical equipment, conveyors, furnaces, machine tools, electric trucks, etc. Manufacturers of all of these items of equipment are sorely in need of business. Orders for this one plant would provide 352,000 man-hours of work for equipment manufacturers alone.

It is gratifying that during the past two weeks Washington has showed signs of awaking to the real need of encouraging rather than discouraging expenditures for plant and equipment. The possibility of assistance through government financing is being studied. Methods of enabling the railroads to buy needed power and rolling stock are under consideration. More attention is being given to the problems of the building industries.

Since we are committed to artificial stimulation of business, the sooner the neglect of the capital goods industries is remedied, the sooner will the controlled program of general recovery move forward uniformly.

THE BUSINESS TREND

Business, Spotty, Is Pointed Toward Improvement

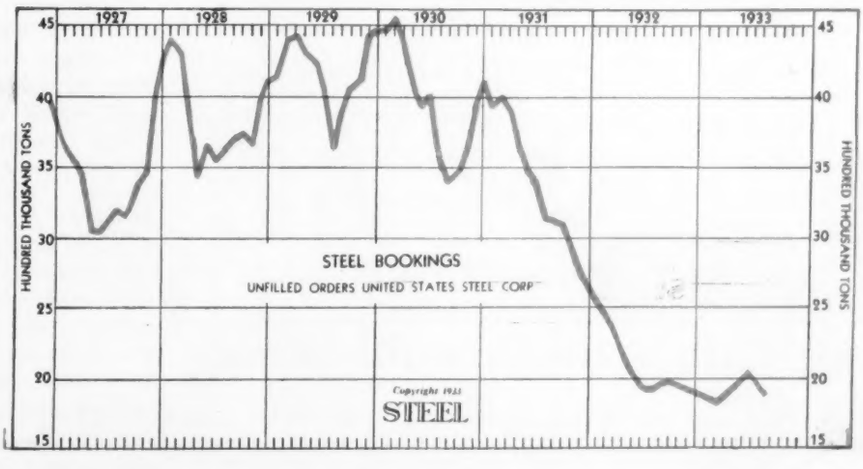
BUSINESS conditions continue spotty, but with a slightly improved tone. Confusion over the cost and price elements of NRA is subsiding, but uneasiness over labor difficulties persists. Most of the smaller or auxiliary industries still are struggling with codes. The major industries, including steel, textiles, petroleum and automobile are engaged in adjusting their activities to conform to the rules of their adopted codes. In almost all cases, the executives of companies still are devoting more attention to negotiation or administration of codes than to the immediate routine of their own businesses.

In spite of these distractions, business seems to be pointing toward early improvement. Increases in the steelworks operating rate in several districts indicate that the downward drift of the national rate may be halted before it touches 40 per cent of capacity. The unfilled tonnage report of United States Steel, showing 1,890,444 tons as of Aug. 31 or a decline of 129,681 tons, was somewhat better than was predicted in some quarters.

The railroad situation is slightly more encouraging. Car loadings in the week ending Sept. 2 totaled 666,652, the highest point touched this year and also the nearest approach to the 1931 trend line. (The 1932 line was crossed in May.) Loadings for the week ending Sept. 9 will be off sharply on account of the Labor day interruption. Reports of the net earnings for Class I railroads for July showed a total of $64,309,929 against only $11,287,720 in July, 1932. Net earnings for the first seven months of 1933 were $216,740,345 compared with $120,900,560 in the same period last year.

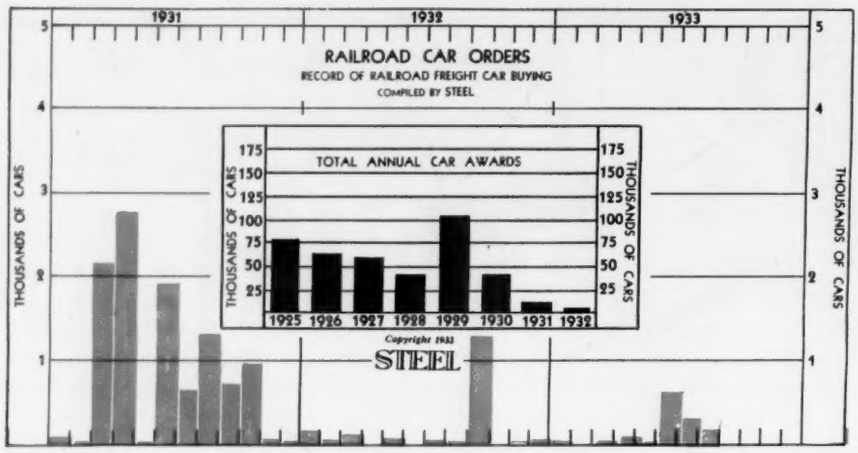
Automobile Production in Eight Months of 1933 Exceeds Output for Entire Year of 1932

Assuming that automobile production in the United States in August was approximately 220,000 cars, the total for eight months of 1933 becomes 1,460,198, as compared with 1,070,916 in the same period of 1932. The eight-month total exceeds the output of 1,370,678 for 12 months of last year.



1933 Million Tons	
August	1,890
July	2,020
June	2,106
May	1,929
April	1,864

1932 Million Tons	
August	1,969
July	1,966
June	2,034
May	2,177
April	2,326



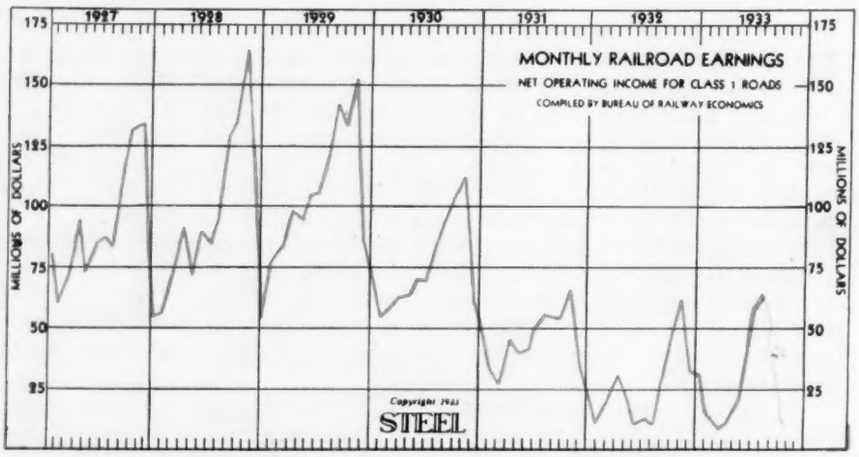
August, 1933	202
July, 1933	306
August, 1932	5

Freight Car Buying Declines in August

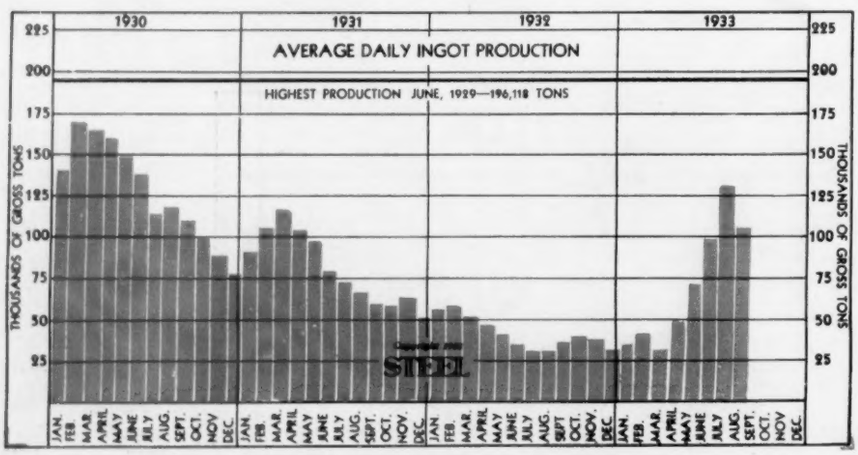
Domestic freight car awards during August totaled 202 units, bringing the total for the first eight months to 1074 cars, compared with 389 cars in the corresponding period last year and 8965 in the first eight months of 1931. In August last year there were awards for only 5 cars. The upturn in car loadings and railroad freight revenues has improved the tenuous financial positions of many roads, and as a result, car builders are looking hopefully to this fall for at least a moderate improvement in lettings.

July Railway Earnings Highest Since 1930

Class 1 railroads of the United States for July had a net operating income of $64,309,929, which, for that month was at the annual rate of return of 2.75 per cent on their property investment. This current report, compiled by the bureau of railway economics marks the fifth consecutive monthly improvement. To find a higher monthly operating income it is necessary to go back to October, 1930, when earnings reached $110,923,349.



July, 1933	**$64,309,929**
June, 1933	59,483,185
July, 1932	11,287,720



August, 1933	107,430
July, 1933	128,152
August, 1932	31,360

August Ingot Production Off 16 Per Cent

Production of steel ingots in August was at the rate of 107,430 gross tons per day, a decline of 16 per cent from the high mark of July. In spite of this decline in August, daily output was nearly 245 per cent greater than for the corresponding month last year. According to the report of the American Iron and Steel institute total calculated output for eight months of 1933 is 15,093,613 tons, compared with 9,350,662 tons in the same period of 1932.

Steel beer barrels made from stainless-clad steel. They were displayed at a dinner given International Police chiefs at Press Club of Chicago, Aug. 1. Construction of the beer barrels, which are of Krupp design, was described in the July 3 issue of STEEL, *page 27*

DEVELOPS TECHNIQUE FOR FABRICATING 18-8 STAINLESS-CLAD STEELS

BY E. C. KREUTZBERG
Eastern Manager, STEEL

HIGH cost of solid stainless steel has prohibited its use in many applications involving heat, acid and corrosion-resisting characteristics. Early in the development of this steel, therefore, metallurgists visioned a solution to the problem through production of a combination material having a thin surface of stainless steel and a base or back of low-cost plain carbon steel.

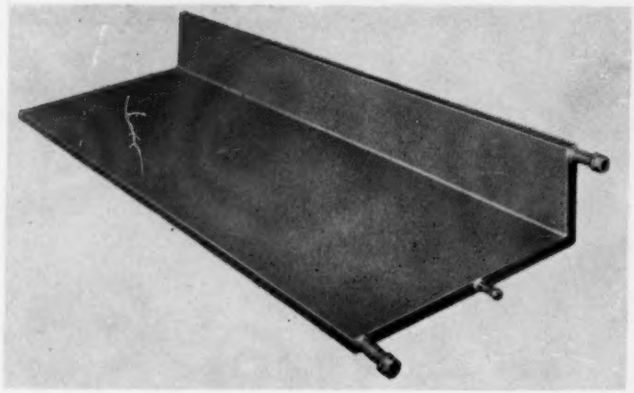
After extensive experimentation, the Ingersoll Steel & Disc Co., Chicago, a division of the Borg-Warner Corp., announced the development of such a stainless-clad material, known as Ingoclad, produced by a process which assures a bond between the stainless surface and the base metal. This new metal, something of its development, characteristics and applications, were discussed in the Feb. 6 issue of STEEL.

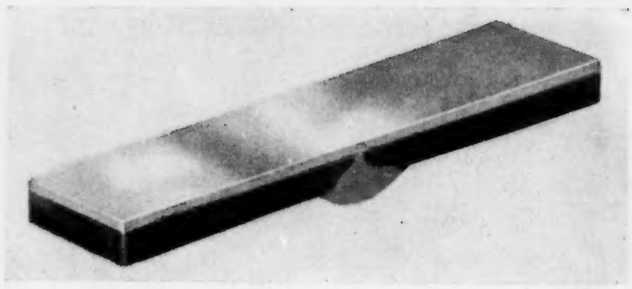
The company now is rolling this material at its Newcastle, Ind., mill in sheets and plates in commercial gages, lengths and widths. More recently, the producer started fabricating the material into beer barrels with stainless-clad linings. In addition, the clad metal is being sold to fabricators and consumers for applications in which the requirements are met by a 20 per cent layer of stainless steel backed by mild steel. An even more recent development is the production of stainless clad in the form of roll strip in the thinner gages. Strip has been produced successfully as light as 0.025 inches. Industries in which this material has gained acceptance include those engaged in manufacturing soap, various kinds of brewery and auxiliary equipment, electric refrigerators, dairy equipment, food products, automobile trim, chemical and process equipment, and the like.

The clad material also has been developed experimentally and soon will be on the market in the form of rolled and spiral welded pipe wherein the stainless surface may be either on the inside or the outside of the pipe as desired. The proper stainless cladding for each particular pipe application will be available.

Stainless steels vary with their composition in the resistance to various corrosive media. This is true also for stainless-clad steel, hence the company furnishes its material faced with several variations of the straight chrome and chrome-nickel analysis. It is interesting to note that these stainless-clad steels sell at prices which are approximately one-half those of solid stainless steels.

Ingersoll Steel & Disc Co. has developed special technique for both production and fabrication of stainless clad. In the patented process of production, two ground, stainless steel plate inserts with a layer of insulating





AT THE left is shown a window display refrigerating plate made by the Dole Refrigerator Machine Co., Chicago, from 16-gage stainless-clad steel. Shown above is a specimen of butt welded stainless-clad steel of 18-8 analysis. The weld was produced by the Alloy Products Corp., Waukesha, Wis., using stainless rod

material between them are joined together by an unbroken weld entirely around their four sides. This insert is then placed in an ingot mold and held in correct position. When the hot, mild steel is poured into the mold it completely envelops the stainless inserts.

In rolling, the composite ingot is reduced uniformly and the welding of the edges of the insert prevents defects which might result from the admission of hot metal or gases between the stainless sheets. After the rolling operation is completed, the sides and ends of the rolled product are sheared, which results in two plates each one-half the thickness of the rolled plate. It is clear that by this process of sealing the stainless inserts there is no possible chance for scale to appear inasmuch as air and oxygen are completely eliminated, therefore, an unusually clean surface is obtained.

Stainless Usually 20 Per Cent

Stainless clad sheets and plates usually are furnished by this company with a stainless facing comprising 20 per cent of the total thickness. The proportion is set in the ingot. In ordinary practice, for instance, an ingot 15 inches thick is made up of 12 inches of mild steel and 3 inches of stainless.

The company recommends the use of stainless-clad within certain clearly defined limitations. It can be used only where an unbroken stainless surface is required. Thus, stainless clad is eliminated from such applications as perforated sheets and plates, in which the underlying mild steel would become exposed in fabrication, or from applications where there is a corrosive action on both sides of the sheet or plate. It also is eliminated from heat applications in which the creep strength of mild steel or its anti-scaling properties at elevated temperatures are not found sufficient. The limit of stainless-clad steel in heat applications is about 800 degrees Fahr.

In general, the fabrication of stainless clad is accomplished with the same equipment used on plain, mild steel. It can be cut, punched, sheared, spun, bent and otherwise worked without need for special equipment. Furthermore, stainless clad has higher physical properties than mild steel, thus increasing the strength of the fabricated article.

Based on thorough experience in its own shops, the company has assembled complete data for the guidance of fabricators in working with stainless-clad steel. These are set forth herewith under the proper captions.

Welding—Welding practice is practically the same as for solid stainless steel. Therefore, it is necessary to reverse the polarity in the case of arc welding, which is decidedly the recommended method. In general, the rod used for a particular stainless-cladding formula should have a higher alloy content than the stainless clad, depending upon the corrosive problem involved. For instance, in the 18-8 clad sheets a 20-10 or a 25-12 chrome-nickel coated rod should be used. Experience shows that welds made with such high-alloy rods have the same corrosion resistance as the stainless surface of the clad sheets and plates, and are of about the same ductility. Welding should be carried on with the utmost speed and no local overheating should be permitted. In this respect, however, it is found that stainless-clad overheats much less rapidly than solid stainless as the mild steel backing in the stainless-clad carries off the heat rapidly.

As heretofore mentioned, reverse polarity is used as in the welding of solid stainless steel, and the amperage is reduced proportionately according to the size electrode required for a particular size sheet or plate. In most cases when welding clad sheets the welding should be conducted from the stainless side. On the thicker plates the same procedure is used, except a soft steel rod may be used to fill in the mild steel side of the plate.

It is recommended that the welder of stainless clad consult the manufacturer of the steel, a manufacturer of welding machinery, or a producer of welding rod, as to the procedure to follow in making various types of welds.

Deep Drawing—In deep drawing the reductions and the practice are somewhat different than with mild steel. With all stainless-clads the pad pressures should not be excessive; they should be sufficiently high to permit the material to flow without being stretched. The radius over which the steel is drawn should be eased considerably. In 18-8 cladding a maximum of 42 per cent reduction may be taken in the first draw. Annealing at over 1800 degrees Fahr. with quick cooling must follow the first draw to allow a re-draw of 20 per cent, after which a final anneal at over 1800 degrees with quick cooling must follow.

Pickling — Pickling is required after each annealing.

Dies—Best results are obtained with hard bronze die-rings and either tool steel or heat treated cast iron punches. Die clearances should be sufficient so as to not crowd the metal. On 16 to 20 gage material 1/32-inch die clearance is required on the first draw to each side, over stock thickness. On heavier gages 1/16-inch die clearance is necessary for the first draw. On the re-draw clearances should be 0.020 to 0.030 inches at the throat of the die, over stock thickness on each side. The material should be allowed to draw as freely as possible.

The most important point in drawing stainless or stainless-clad steels is to allow the metal to flow freely in each operation and in no case to attempt any reduction in thickness.

Lubricants on Blanks and Dies—Best results are obtained with lard oil with a sulphur base to which talc or lithopone is added. Lubricants always should be removed carefully when an annealing is required between draws.

Heat Treating and Annealing—Before deep drawing and other forming operations, stainless clad is treated the same as mild steel. This involves either a normalizing or an annealing treatment, or a combination of the two. To get the maximum properties of 18-8 clad, it is necessary to normalize at above 1800 degrees Fahr.

Riveting—Stainless clad is riveted in the same way as mild steel, but the

analysis of the rivets must be the same as the analysis of the corrosion-resistant cladding.

Preparation of Surface—Stainless clad in its various forms, such as plates and sheets, is delivered with various surface finishes, depending on how it is ordered. Regardless of the surface condition in which it is delivered, the stainless surface must be free from scale when finally placed in service. The various methods by which this result may be accomplished are set forth in the following paragraph. One or more of these methods must always be used as the presence of scale in the slightest degree on the finished product will surely result in surface attack.

Pickling and Passivating—For removing the scale formed in heating for rolling, welding, annealing or heat treating, the following pickling solutions are recommended: (1) 10 per cent hydrochloric acid plus 10 per cent sulphuric acid at 170 to 190 degrees Fahr.; (2) A cheaper solution is the following: 10 per cent sulphuric acid plus 10 to 12 per cent of rock salt by weight, the effect of the rock salt being to liberate hydrochloric acid in the solution; (3) A white pickling solution consists of 10 per cent nitric acid and 1 to 3 per cent hydrofluoric acid used cold; to accelerate the starting it might be necessary to warm the bath to 120 degrees. The bath itself keeps up its own temperature if used constantly.

The time in this solution should be only long enough to remove the smudge, as the carbon side is rapidly attacked by the nitric acid. The white pickling solution is usually used as a final finishing operation, as the No. 1 pickling solution always is required if it is an intermediate one such as between draws.

Sand Blasting—Sand blasting may be used for removing scale where the scale is excessive in order to shorten the above pickling operation. Sand blasted surfaces will not be entirely rust resistant as sand blasting imbeds particles of scale in the surface of the material.

Shearing, Punching and Drilling—Stainless-clad steel will shear, punch and drill more easily than solid stainless because 80 per cent of the thickness is soft steel.

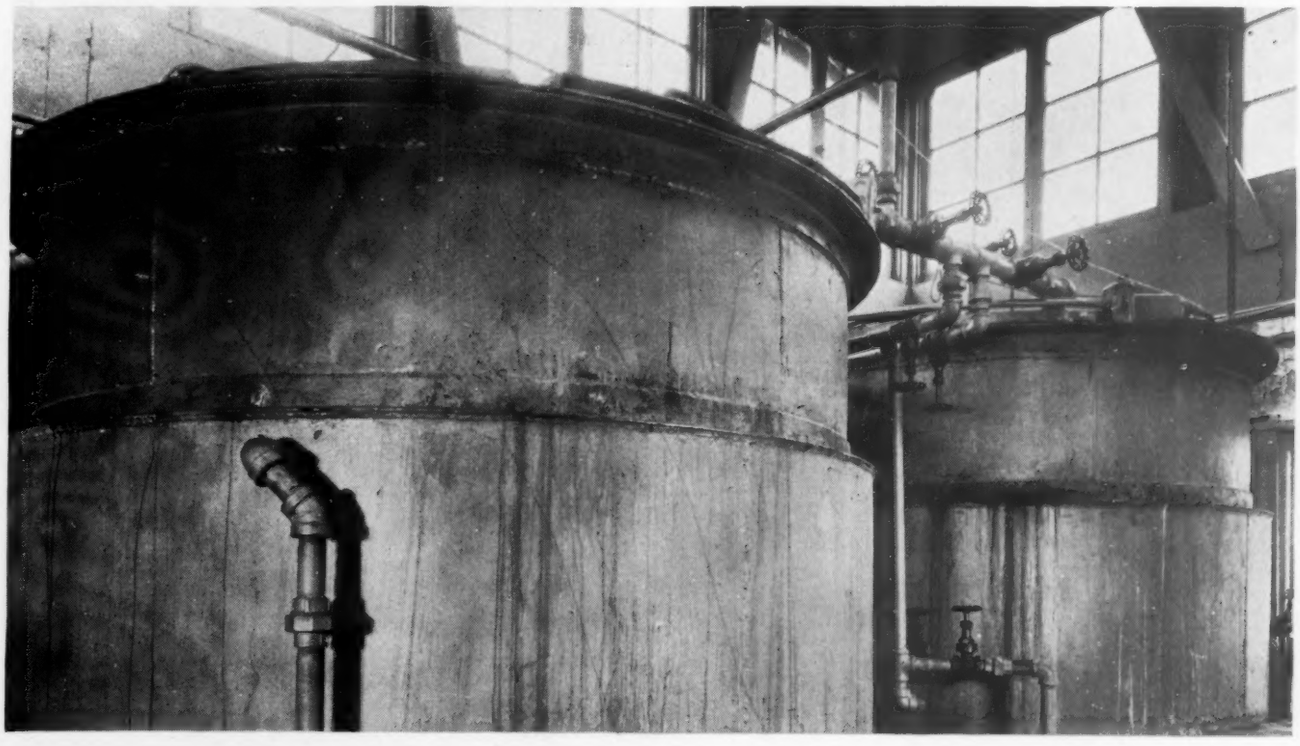
Roll Forming and Braking—Bending, forming and braking can be readily accomplished and molding with fairly sharp angles can be produced. In roll forming, the set-up customary for brass and mild steel generally is used, but in braking as well as roll forming a water-soluble drawing oil or lard oil should be used to protect the surface. The parts should be washed after forming and then passivated in nitric acid.

Grinding and Polishing—As a general rule, where forming, rolling or spinning is used, the material is ordered from the mill with a finish that will permit an initial grit of 120 grain. If a better finish is desired, then finer grits should be used according to the desired finish requirements. Ordinarily the only grinding necessary on the part of the fabricator of stainless-cladding is to remove the die marks.

The same procedure is recommended for grinding, polishing and buffing stainless-clad steels as is followed for solid stainless. If a brushing operation is necessary, a stainless or non-metallic brush should be used—never a wire brush as this will imbed steel particles into the surface which will promote corrosion.

Soldering—Stainless-clad can be soldered without difficulty, firm and strong joints being produced. For pickled finish material, the ordinary muriatic acid cut with zinc may be used. For polished articles, if there is difficulty in making the solder adhere, the surface may be dulled with the following solution: Muriatic acid (HCl), 90 parts by weight; ferric chloride ($FeCl_3$), 50 parts by weight; and nitric acid (HNO_3), 3 parts by weight.

This solution should be allowed to set for 5 to 10 minutes, or longer if necessary, then wiped off. Tinning then is done in the usual way. If difficulty still is encountered, an acid solution similar to the above, but which has been cut with zinc, should be used. After soldering, all traces of acid must be thoroughly removed by washing with soap and water plus a small amount of washing soda, as the acid attacks the metal readily. To protect the metal from acid splashes during soldering and tinning, the area adjoining the edges to be soldered or tinned can be protected with a grease or paraffin coating. To increase the fluidity of the solder, sprinkle sal am-



Casein cookers of stainless-clad steel in operation in plant of Marsene Transparent Paper Corp. of America, Gary, Ind. They were built by the Chicago Bridge & Iron Works, Chicago

moniac powder over the tinned part before the application of the soldering iron.

Riveting, spot-welding or lock seaming should be depended upon for strength, the soldering being used merely to seal the joints.

Brazing and Silver Soldering—Stainless-clad can be brazed and silver soldered satisfactorily. A satisfactory flux for brazing or silver soldering may be made by mixing equal parts of borax and potassium fluoride with water to the consistency of a thin paste. Clean the parts to be soldered and thoroughly cover them with the paste.

Protection of Polished Surfaces During Fabrication—The use of polished material often is possible where forming operations are not too severe, thereby eliminating considerable expensive polishing. Where this is done, great care must be exercised to prevent scratching and denting during pressing and braking, and the following suggestions will be helpful: (1) Dies should be kept in good condition and re-conditioned at the first sign of any pick-up; (2) proper lubricants should be used, on long runs compounds containing lard oil, lithopone and talc are recommended. Good commercial lubricants with lithopone as a base are now available for use on stainless; (3) paper, oiled or waxed, can be used between the dies and the work, and on brakes adhesive tape will often prevent damage to the work; (4) parts should be thoroughly cleaned of all oil or drawing lubricants before annealing.

In all of the foregoing material regarding the fabrication and handling of stainless-clad steel the discussion has dealt with the cladding of 18-8. It is interesting to note that considerable development work is being done in the Ingersoll plant in Newcastle on stainless-clad materials wherein the stainless surface involves several different formulas. Much work has been done in the 16/18 straight chrome series and also in the special types of alloys such as the chrome, copper and silicon alloy known as Nevastain RA being produced by the Ludlum Steel Co., Watervliet, N. Y. As further development work progresses information similar to that presented herewith will be available for other stainless surfaces than the 18-8 classification.

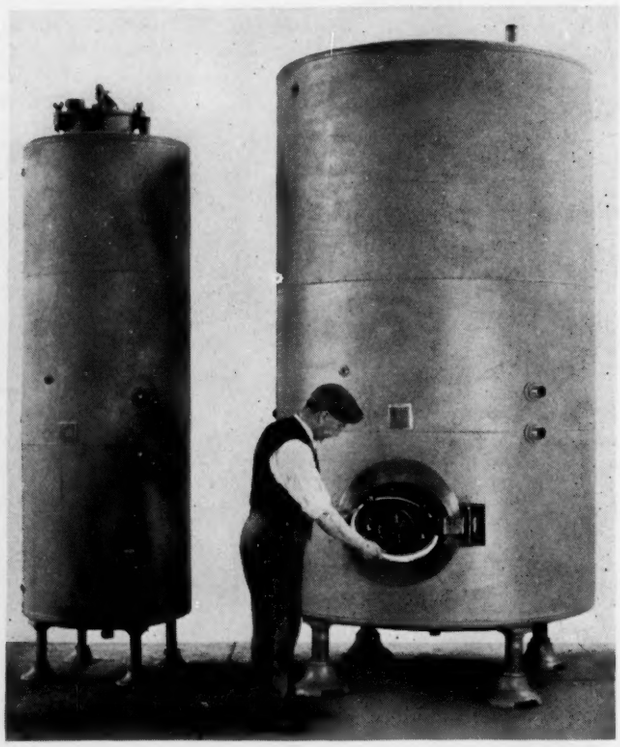
It is evident from the many types of installations and uses of stainless-clad steels that have already been put into service, ranging all the way from architectural trim to pressure vessels, that the users and fabricators are taking advantage of the fact that this material, in many instances, gives just as satisfactory results as solid stainless steel, and at substantially less cost.

New Listing of Research Laboratories Issued

Fifth edition of bulletin 91 of the National Research council, Washington, listing industrial and consulting research laboratories of the United States, has been issued. The bulletin, selling for $2, was compiled by Clarence J. West and Callie Hull. Listings are considered correct as of Jan. 1, 1933. Number of laboratories listed is 1575, showing a decrease of 50 from the number listed in the preceding edition. Each listing includes information on personnel of the laboratory and the type of research work being performed. Over 135 laboratories are listed as being actively engaged in research problems dealing with iron and steel.

Gas Association Schedules Meeting in Chicago

Fifteenth annual convention of the American Gas association will be held Sept. 25-29 at Hotel Stevens, Chicago, in conjunction with an International Gas conference. Further details of the meeting are available from Alexander Forward, managing director of the association, 420 Lexington avenue, New York.



(Left)—Brewery tanks of stainless-clad steel under construction in shop of Hamler Boiler & Tank Co., Chicago. (Right)—Yeast culture tanks built of 10-gage stainless clad steel with all seams butt welded and ground smooth on the inside. The larger tank is 68 inches diameter and 123 inches high and contains a 54-inch coil made of 2-inch 16-gage solid stainless steel tubing welded and tested at 600 pounds pressure. The smaller tank is 37 inches diameter and 118 inches high and is similar to the larger one except that the manhole is on top. The coil also is of solid stainless steel and is 27 inches diameter. Both tanks were built by the Alloy ProductsCorp., Waukesha, Wis., and shipped to the Miller High Life Co., Milwaukee

Seen

at A

CENTURY OF PROGRESS

HEAT and wear resisting properties of stellite cutting tools are demonstrated among other exhibits of the Union Carbide & Carbon Corp., New York. Oxyacetylene flames keep a tool at red heat as it machines a piece in a lathe, while bars of stellite and carbon steel pressed against a grinding wheel illustrate the relatively small amount of wear experienced by the former.

A large diorama showing all subsidiary plants is one of the features of the Union Carbide & Carbon display. Practical demonstrations of the use of the oxyacetylene torch in cutting and welding metals is another attraction. A small talking motion picture describes the story of alloys in steel. Linde Air Products Co. sponsors a show which includes various experiments with liquid air. All subsidiary companies of the Union Carbide corporation also are represented with exhibits.

In the illustration above, the panel shown at the bottom of the booth is made from 18-8 stainless steel etched in three tones by sand-blasting.

♦ ♦ ♦

Bouncing, rolling and revolving balls, and clicking of assorted animated displays attract visitors in the General Motors building to the exhibit of the New Departure Mfg. Co., Bristol, Conn., where ball bearings and other products are compelling displayed against a background of walnut veneer, green and gold leaf.

In addition to the familiar bouncing balls, which demonstrate uniform steel structure and sphericity, leaping perfectly synchronized through the bore of a revolving bearing, the center of attention is the spectacle of two large steel balls which roll without apparent means of propulsion around a miniature track.

In the center section under shadow of a canopy appears the company's slogan "Nothing Rolls Like a Ball," spelled out by steel balls against a velvet background. To casual passers-by, these balls appear to revolve, although actually they stand still.

Flanking this center grouping are two large murals depicting uses of the company's products and below each are indirectly lighted recesses displaying various types of ball bearings. A series of slide films showing successive steps in maintenance of quality manufacture and many famous machines of land, air and water which perform on ball bearings, are projected from the rear onto a translux screen.

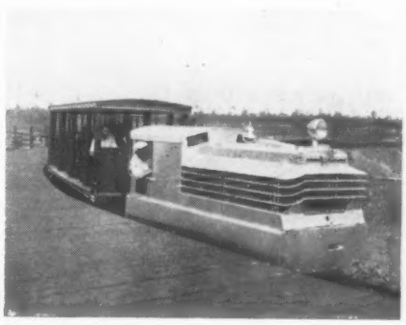
For those interested in bicycle riding, a cut-open and animated coaster brake moves from driving to coasting to braking positions to demonstrate this well-known control device for two-wheelers.

One of the unique exhibits under the dome of the Travel and Transport building is that of the Harnischfeger Corp., Milwaukee. The booth is constructed of various metals, such as aluminum, copper, brass and steel, all welded together by the company's Hansen-type arc welder. Attracting attention is a newly developed arc torch for brazing nonferrous metals. This torch can be operated from a standard arc welder generator. An attendant demonstrates the joining of various metals and alloys, including aluminum, which heretofore have not been commonly fabricated by the arc welding process.

In addition to novel performance demonstrations and display of welded samples, the company shows a hoist in operation, pictures tracing the origin and development of the electric traveling crane, and pictures of a barrel pitching machine now restored to a position of prominence with the return of beer. Although originally developed more than 40 years ago, the pitching machine has been modernized to meet requirements of the present-day brewery.

♦ ♦ ♦

A narrow-gage railway has been provided for hauling passengers from the downtown section of Chicago to the gateway of the fair. This railroad takes passengers from the Michigan boulevard bridge near Monroe street, where the Century of Progress art exhibits are located, along the shores of Lake Michigan, through Grant Park, passing Buckingham fountain, to the main entrance of the Twelfth street gates at the Shedd Aquarium.



Six 8-ton gasoline locomotives, built by the Plymouth Locomotive Works, Plymouth, O., haul seven coaches each over the tracks on regular schedules. Each coach accommodates 28 passengers. The six trains have a capacity of 5000 persons an hour. The coaches were built by the Koppel Industrial Car & Equipment Co., Koppel, Pa. This railroad is typical of those used extensively throughout the country for construction work and material hauling in which the Plymouth company's industrial locomotives have played an important part.

♦ ♦ ♦

An all-steel watch, said to be one of the first of its kind, was presented on July 31 to Miss Louise Sholl, 20-year-old girl cashier from Durant, Okla., for being the millionth visitor to inspect the exhibit of the United States Steel Corp. Presentation of the gift was made by D. A. Merriman, vice president, American Steel & Wire Co., and chairman of the Steel corporation exposition committee. Both the works and the case of the watch are made of stainless steel.

Making the Most of

METHODS AND MATERIALS

A NEW enamel, with which a large automobile maker is finishing its standard bodies, is claimed to be the most durable automobile finish yet developed. One of its chief advantages is that it retains its luster and fresh appearance for a long time. It dulls slowly under exposure to weather, but as this dulling is only a surface condition, the finish can be restored to its original sheen easily. Once oven baked on the body, it is practically insoluble in powerful solvents and is unaffected by radiator alcohol. It wears away slowly under polishing. Another advantage is that it adheres tenaciously to metals and as it is a lustrous composition of itself, it does not require a finish polishing. The synthetic resin used in making the enamel is a combination of glycerin and phthalic acid, manufactured from coal tar, and is remarkable for its stability.

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Broken studs can be removed easily by building them up ½-inch or more above the surface level at which they have broken off, using the blowpipe flame and steel welding rod. When the steel has cooled off to atmospheric or room temperature, the stud will have shrunk sufficiently after the heating to permit its being turned easily with a pipe wrench. One blacksmith welder has performed this operation successfully on studs from ¼ to 1½ inches diameter, and there appears no reason why larger studs cannot be removed in the same way.

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IN THE pneumatic tool industry, hard chromium plating is being used to reclaim pistons, cylinders, valves, and other parts subjected to wear and corrosion. When a tool is reparts are replaced by parts which have been plated and ground to standard size, and the worn parts returned for overhauling, the worn turned to the factory for reclamation. Thus the tool is repaired at a lower cost than formerly, it is laid up for repairs a very short time, and returned to the user in a condition that will give several times the service that the original tool did.

$ $ $

Hardfacing of high-carbon steel is not recommended as a rule, although expert welders can accomplish it successfully. Worn parts should be built up almost to required size with a suitable rod before applying the facing. The hardfacing materials have insufficient strength and ductility and are too costly for use as build-up rods. They are for the overlay only.

$ $ $

Spectroscopy is the somewhat formidable term applied to a science which is beginning to find application in the foundry through one of the branches, spectrum analysis. Through a clever combination of camera, prism and mirrors, a char-

acteristic film is obtained of any desired specimen. By close observation of the marks on the film, the skilled operator can determine the relative amount of each of the elements involved.

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Stove dealers have reported an active demand for stoves with stainless steel tops, as a means for overcoming unsightly rusty appearance of many present stoves. Work is proceeding toward the development of a suitable stainless cast iron which can be used in this application.

$ $ $

An authority on malleable iron has stated that alloys have no place in malleable castings. Exception may be taken to this statement. Today malleable castings are being diversified and there are several well-defined types. One contains appreciable amounts of molybdenum, another has high manganese and the most recent contains chromium and silicon. Malleable foundrymen have been educated to consider chromium as a source of trouble, although now up to 0.50 per cent of this element is being used commercially. The well-known effect of chromium in preventing the annealing operation is overcome by increased silicon. A number of test bars containing 0.30 per cent chromium with 1.40 per cent silicon averaged about 80,000 pounds per square inch tensile strength with over 9 per cent elongation.

$ $ $

HARDFACING the ordinary steel forgings has increased the life of blades for a vertical pug mill from 1 to 5 weeks in a Michigan pottery plant. These blades are roughly ¾-inch thick and 3½ x 5 x 7 inches in size. Thirteen blades require approximately 4 pounds of stellite applied ⅛-inch thick on the edges and 1/16 to 3/32-inch thick on the flats.

$ $ $

By spending $15, a foundry saved $150. A riser in a nickel semisteel casting which had been nicked and flogged off carried with it a part of the casting. The hole left by this accident was refilled by means of the blowpipe, using a welding rod of composition similar to the base material, and thus reclaiming an otherwise good casting.

$ $ $

Weight loss tests of cast steel valves containing 5 per cent chromium and 0.5 per cent molybdenum in hot petroleum vapors indicated four to five times the service of carbon cast steel. One large refinery, however, has reported that its tests gave this chrome-molybdenum steel a rating of thirty-three times the life of carbon steel in oil cracking service. Although developed primarily for this application, this steel has excellent physical properties both at normal and elevated temperatures, making it suitable for other types of valves and fittings service wherein severe conditions are encountered. The molybdenum content assists greatly in strength retention at high temperatures. It necessitates a final heat treatment tempering heat of approximately 200 degrees Fahr. over a 5 per cent chromium steel without molybdenum.

Analysis of Factors Influencing

Rolling Pressure and Power Consumption In the Hot Rolling of Steel

BY SVEN EKELUND

Translated by BENGT BLOMQUIST

Part II—Geometrical and Dynamical Conception of Parallelopipedal Deformation

(Fifth Article of Series)

IN ORDER to investigate the velocity effect for parallelopipedal deformation in three dimensions, equations (15a) and (16a) may be used. It is assumed that each of these equations can be treated separately, thus allowing the projections of the movement on the $x-z$ and $y-z$ planes to be investigated. The deformation may be considered as occurring in such a way that some particles are deformed in one direction and some particles in the other. Assume that the compression takes place along the Z-axis with the velocity v_h at the height of h. Then:

$$v_h = \frac{dh}{dt}\,;\; v_l = \frac{dl}{dt}\,;\; v_b = \frac{db}{dt}$$

According to equation 12:

$$-\frac{dh}{h} = \frac{dl}{l} + \frac{db}{b}$$

Dividing by dt, the following equation is obtained:

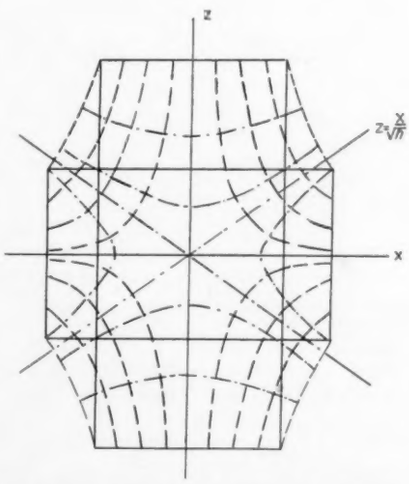


Fig. 10—Courses of particles along Z-axis during compressive movement

$$-\frac{v_h}{h} = \frac{v_l}{l} + \frac{v_b}{b} \quad \ldots\ldots (20)\,;$$

and correspondingly:

$$-\frac{v_z}{z} = \frac{v_x}{x} + \frac{v_y}{y}\,;\; v_z = \frac{z}{h}\cdot v_h \ldots (20a).$$

Equations (15a) and (16a) represent the courses of the particles along the Z-axis during the compressive movement. In Fig. 10, some of these courses are drawn in the $X-Z$ plane for $n=2$. The courses are curved. The particles thus are subjected to a change of movement perpendicular to the course.

The shearing forces which, because of the velocity effect, are parallel with and perpendicular to the course, first will be determined.

$$x^n \cdot z = k\,;\; \frac{dx}{dz} = -\frac{k}{z^2}\cdot\frac{1}{n\,x^{n-1}} = -\frac{x}{nz}$$

For curves intersecting $x^n \cdot z = k$ perpendicularly, the following expression is valid:

$$\frac{dx}{dz} = \frac{nz}{x}$$

and after integration:

$$x^2 - nz^2 = \pm c \quad \ldots\ldots (21).$$

These curves are therefore hyperbolas with asymptotes:

$$z = \pm\frac{x}{\sqrt{n}}$$

the transverse axes of which coincide with the X and Z axes (in Fig. 10 the hyperbolas are drawn in dot and dash lines).

The velocity in the course is:

$$v_s = v_z\sqrt{\left(\frac{dx}{dz}\right)^2+1}$$

$$= \frac{v_h}{h\cdot n}\sqrt{x^2+n^2\frac{k^2}{x^{2n}}}$$

$$= \frac{v_h}{h\cdot n}\sqrt{x^2+n^2z^2}$$

If $z=\dfrac{k}{x^n}$ is substituted in equation (21):

$$k^2 = \frac{1}{n}\left(x^{2n+2} \mp c\cdot x^{2n}\right)$$

and

$$v_s = \frac{v_h}{h\cdot n}\sqrt{x^2+n(x^2\mp c)}$$

In order to find the difference in velocity in the direction of the course between two points which are located on a line perpendicular to the course, v_s is to be differentiated with c as a constant, which means that the differentiation is carried out along one of the hyperbolas mentioned..

$$dv_s = \frac{v_h}{h\cdot n}\cdot\frac{x(n+1)\,dx}{\sqrt{x^2+n(x^2\pm c)}}$$

$$= \frac{v_h}{h\cdot n}\cdot\frac{x(n+1)\,dx}{\sqrt{x^2+n^2+z^2}}$$

Then:

$$\frac{ds}{du} = \frac{dz}{dx} = -\frac{nz}{x}$$

In the Fig. 11, dv_s is the difference in velocity between points 1 and 2 at the distance $d\rho$ from each other. The shearing force between two surface elements $ds=1$ is:

$$dk_s = \eta\cdot\frac{dv_s}{d\rho}\cdot ds\cdot 1$$

$$= -\eta\frac{v_h}{h}\cdot\frac{(n+1)z\cdot dx}{\sqrt{x^2+n^2+z^2}}$$

If the course has the radius of curvature:

$$\rho = \frac{\left[1+\left(\frac{dz}{dx}\right)^2\right]^{3/2}}{\frac{d^2z}{dx^2}}$$

the change in velocity perpendicular to the curve will be:

$$\frac{dv\rho}{dt} = \frac{v_s^2}{\rho}$$

Thus, the difference in velocity in the same direction, between two points 2

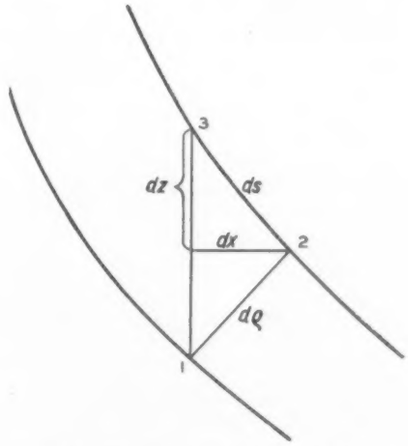


Fig. 11—Diagram showing difference in velocity between two points

and 3 on the curve, will be:

$$dv\rho = \frac{v_h^3}{\rho}\,;\; dt = \frac{h \cdot dz}{v_h \cdot z} = -\frac{h}{v_h} \cdot \frac{n dx}{x} \cdot$$

$$\frac{dz}{dx} = -\frac{nz}{x}\,;\; \frac{d^2z}{dx^2} = \frac{z}{x^2} \cdot n\,(n-1)$$

$$dv\rho = -\frac{h}{v_h} \cdot \frac{n dx}{x} \cdot \frac{v_h^3}{h^2 n^2}\,(x^2+n^2z^2) \frac{n(n+1)zx}{\sqrt{(x^2+n^2z^2)^3}}$$

$$= -\frac{v_h \cdot n(n-1) \cdot z dx}{h \cdot n\sqrt{x^2+n^2z^2}}$$

Accordingly, the shearing force between two surface elements $d\rho \cdot 1$ will be:

$$dK\rho = \eta \cdot \frac{dv\rho}{ds} \cdot d\rho \cdot 1 = \eta \cdot dv\rho \cdot \frac{dx}{dz}$$

$$= \eta \cdot \frac{v_h}{h \cdot n} \frac{(n+1) \times dx}{\sqrt{x^2+n^2z^2}}$$

dK_s and $dK\rho$ are perpendicular to each other, so that:

$$\frac{dk_s}{dk\rho} = -\frac{nz}{x} = \frac{dz}{dx} = \frac{ds}{d\rho}$$

From this it follows that the forces dK_s and $dK\rho$ are components of the normal force dK which is parallel to the Z-axis.

$$dk = \sqrt{dk_s^2 + dk\rho^2} = \eta \cdot \frac{v_h}{h} \cdot \frac{n+1}{n} \sqrt{\frac{x^2+n^2z^2}{x^2+n^2z^2}} \cdot dx$$

$$= \eta \cdot \frac{v_h}{h} \cdot \frac{n+1}{n} \cdot dx$$

Since this force acts on the element $dx \cdot 1$, which is the projection of $ds \cdot 1$ and $d\rho \cdot 1$ in the direction of the forces, the normal stress will be:

$$p_{xz} = \eta \cdot \frac{v_h}{h} \cdot \frac{n+1}{n} \qquad (22).$$

The movement in the $Y-Z$ plane can be analyzed in exactly the same way, and provides the relations:

$$p_{yz} = \eta \cdot \frac{v_h}{h} \cdot \frac{n_1+1}{n_1} \qquad (23).$$

$$n_1 = \frac{n}{n-1}\,;\; p_{yz} = \eta \cdot \frac{v_h}{h} \cdot \frac{2n-1}{n}$$

p_{xz} and p_{yz} are independent of the coordinates, but depend upon the constants n and n_1, that is, upon the extent to which the deformation takes place in the $X-Z$ or $Y-Z$ planes.

Nonequilateral deformation may be brought forth by the action of external forces other than the compressive force, for instance, by frictional resistance that is greater in one direction than in another.

The required surface pressure is:

$$p\eta = p_{xz} + p_{yz} = 3\eta \cdot \frac{v_h}{h} \qquad (24).$$

$p\eta$ is also independent of n and n_1.

Because of the described analogy to elastic deformation, the conclusion can be drawn that the deformation in this case is parallelopipedal. A relation between the modulus of shear G and the modulus of elasticity E then can be obtained if η is replaced by G and v_h by dh in equation (24), the expression can be written:

$$p_E = 3G \cdot \frac{dh}{h} = E \cdot \frac{dh}{h}$$

where $\frac{dh}{h}$ expresses the specific compression. Thus:

$$G = \frac{E}{3}$$

In reality, a slightly different value is valid for soft steel at room temperature, namely:

$$G = \frac{5}{13}\,E$$

Under static load, the normal stress is determined by the resistance to slip in the planes inclined at 45 degrees to the principal direction. Thus, in the case previously discussed for simple compression in one direction, the slip should take place only in these 45-degree planes. The slippage, therefore, should coincide with the curves expressed in equations (15a) and (16a) only in exceptional cases. However, consideration has to be given to the influence upon the stress distribution of the friction which in most cases is present in the pressure surfaces. This influence, naturally, depends upon the dimensions of the body, and also upon the magnitude of the friction, but it should cause a deviation of the principal stress as shown in Fig. 12. Close to the contact surface, the stresses on one side of the center line are directed more or less against the stresses on the other side; while further inside the body, the direction of the stresses changes so that they will be directed from each other. The cause of this change in direction is the internal surpressure, which tends to overcome the external friction.

Up to a certain ratio between thickness and width or length, the external friction exerts this influence throughout the body. The principal stress has a tendency to be located at a 45-degree angle of slip toward the directions which are parallel with and normal to the movement of the material during the deformation. (In Fig. 12, the broken lines indicate the courses of movement of the particles, and the lines of force have been plotted at 45 degrees to these curves). Loci of equal slope of the lines of force then will be straight lines through the origin. In equilateral deformation ($n = n_1 = 2$), the lines of force which are directed toward the origin will form a cone or a pyramid with the base plane, the base angle being 60.7 degrees. Whether this circumstance is connected with the pyramids of slip in plastic materials is difficult to decide. Rather, it is more reasonable to combine these slip-pyramids with the hyperbolic slip-lines perpendicular to the direction of movement, or with their asymptotoes, which form a cone with the generatrix $z = \frac{x}{\sqrt{n}}$. For $n = 2$, this cone will have a base angle of 35.3 degrees.

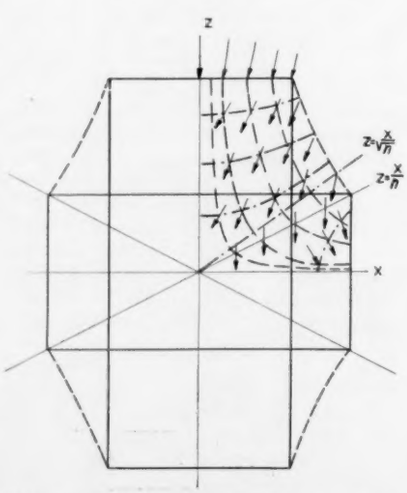


Fig. 12—Broken lines indicate courses of movement of particles

In order to acquire a conception of the influence of the external friction upon the internal work of deformation, the case illustrated in Fig. 12 will be investigated, assuming parallelopipedal deformation. The deformation work in the slip-planes first will be determined, and then this work will be integrated over the entire volume. This total should equal the ideal work at the contact surfaces, which is the real deformation work, regardless of the additional work necessary to overcome the external friction in the surfaces of contact.

For the total compression dh, the work on the element of volume $ds \cdot d\rho \cdot 1$ in the $X-Z$ plane is:

$$d^3A_{xz} = t \cdot ds \cdot dv_s \cdot \frac{dh}{v_h} + t \cdot d\rho \cdot dv_s \cdot \frac{dh}{v_h}$$

The work per unit of volume, which is the specific work, is:

$$dA_{xz} = \frac{1}{ds \cdot d\rho \cdot 1} \cdot d^3A_{xz}$$

$$= t \cdot \frac{dh}{v_h}\left(\frac{dv_s}{d\rho} + \frac{dv\rho}{ds}\right)$$

According to equations previously derived:

$$dA_{xz} = t \cdot \frac{dh}{h} \cdot \frac{n+1}{n}\left(\frac{nxz}{x^2+n^2z^2} + \frac{nxz}{x^2+n^2z^2}\right)$$

The two terms within the bracket are alike, which means that the magnitudes of work parallel with and normal to the course are equal. Then:

$$dA_{xz} = t \cdot \frac{dh}{h} \cdot \frac{n+1}{n} \cdot \frac{2nxz}{x^2+n^2z^2} \qquad (25a).$$

For the $Y-Z$ plane, the specific work is:

$$dA_{yz} = t \cdot \frac{dh}{h} \cdot \frac{n_1+1}{n_1} \cdot \frac{2n_1yz}{y^2+n_1^2z^2} \ldots (25b).$$

The work thus depends upon the coordinates. In each of the two planes, the maximum work occurs for $x = n \cdot z$ and $y = n_1 \cdot z$; that is, along the straight lines through the origin, where the direction of slip is inclined at 45 degrees to the Z-axis, and where the line of force is vertical. On each side of these maximum lines there are zones closer to the axis in which the deformation work is less.

In the compression of a cylinder, of which the height is greater than half of the diameter, it is observed that the sides first swell close to the contact surfaces, and later at the middle, as shown in Fig. 13. A regular parallelopipedal deformation, therefore, cannot take place, because the deformation work becomes less in certain parts. These parts, however, are subjected to initial deformation in such a direction that the work will increase, so that an equalization of the total work inside the body will be effected. Thus, it is not necessary to assume the existence of slip-pyramids in order to explain the cause of the described swelling.

If equation (25a) is integrated between the limits $0 - \frac{l}{2}$ and $0 - \frac{h}{2}$, the work for the entire body $l \cdot h \cdot 1$ with regard to the $X-Z$ plane will be:

$$dA_{xz} = t \cdot \frac{dh}{h} \cdot \frac{n+1}{n^2} \cdot b \cdot \frac{l^2}{2} \left[log_e \left(1 + \frac{n^2h^2}{l^2} \right) + \frac{n^2h^2}{l^2} log_e \left(1 + \frac{l^2}{n^2h^2} \right) \right] \ldots\ldots (26a).$$

The expression within the bracket may be called a_x.

Table VII contains numerical values for a_x, corresponding to certain chosen values for $\frac{nh}{l}$.

For those dimensions which ordinarily occur in rolling and forging, $\frac{nh}{l}$ will be from 0.5 to 2.0. These limits also give the approximate range of validity for the formula. As an average value,

$$\frac{a_x l}{nh} = \frac{4}{3} \text{ can be accepted.}$$

This value, substituted in equation (26a), gives:

$$dA_{xz} = \frac{2}{3} t \cdot \frac{n+1}{n} \cdot b \cdot l \cdot dh = \frac{2}{3} t \cdot \frac{n+1}{n} \cdot V \cdot \frac{dh}{h} \ldots\ldots (26b).$$

In the same way, integration of equation (25b) gives:

TABLE VII

Numerical Values for Use with Formula No. 26a

$\frac{nh}{l}$	a_x	$\frac{a_x \cdot l}{n \cdot h}$
∞	∞	0
3	3.200	1.060
2	2.500	1.250
3/2	2.006	1.337
2	1.909	1.350
4/3	1.815	1.361
1	1.386	1.386 (max)
1/2	0.625	1.250
1/3	0.350	1.060
1/4	0.240	0.950
0	0.000	0.000

$$dA_{yz} = t \cdot \frac{dh}{h} \cdot \frac{n_1+1}{n_1^2} \cdot l \cdot \frac{b^2}{2} \left[log_e \left(1 + \frac{n_1^2h^2}{b^2} \right) + \frac{n_1^2h^2}{b^2} log_e \left(1 + \frac{b^2}{n_1^2h^2} \right) \right] \ldots\ldots (27a).$$

The quantity within the bracket may be called a_y. Inasmuch as $\frac{n_1h}{b}$ also falls between the limits 0.5-2.0 for practical cases, $\frac{a_y \cdot b}{n_1h} = \frac{4}{3}$ can be introduced, and thus:

$$dA_{yz} = \frac{2}{3} t \cdot \frac{n_1+1}{n_1} \cdot b \cdot l \cdot dh = \frac{2}{3} t \cdot \frac{2n-1}{n} \cdot V \cdot \frac{dh}{h} \ldots. (27b).$$

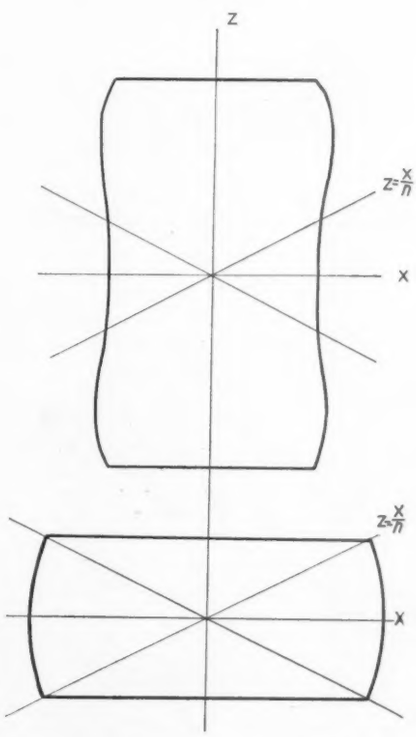


Fig. 13—Diagram of a cylinder showing the effects of compression

The total work is:

$$dA_v = dA_{xz} + dA_{yz} = \frac{2}{3} t \left(\frac{n+1}{n} + \frac{2n-1}{n} \right) \cdot V \cdot \frac{dh}{h} = 2t \cdot V \cdot \frac{dh}{h} \ldots\ldots (28).$$

The work per unit of volume is:

$$dA = 2t \frac{dh}{h}$$

Inasmuch as $\frac{dh}{h}$ is the specific compression, the pressure per unit of area will be:

$$\sigma = 2t \ldots\ldots (29).$$

The general expression for σ, with regard to the variation in the participating pressures, is:

$$\sigma = \frac{1}{2} t \left(\frac{a_x l}{nh} \cdot \frac{n+1}{n} + \frac{a_y b}{n_1 h} \cdot \frac{n_1+1}{n_1} \right) (29a).$$

$\frac{nh}{l} = 1$, $\frac{n_1h}{b} = 1$ $\Big\}$ $n = n_1 = 2$, $l = b = 2h$; $\sigma = \sigma_{max} = 3\ log_e 2t = 2.08t$

$\frac{nh}{l} = 1$, $\frac{n_1h}{b} = \infty$ $\Big\}$ $n = 1, n_1 = \infty$, $l = b = h$; $\sigma = 2\ log_e 2t = 1.39t$

$\frac{nh}{l} = 2$, $\frac{n_1h}{b} = 2$ $\Big\}$ $n = n_1 = 2$, $l = b = h$; $\sigma = 1.88t$

From this it can be concluded that if deformation takes place only in one plane, the pressure will be less than if deformation takes place in both planes, because the work is equal to zero in the plane in which no deformation occurs.

In order to check this relation, an experiment was carried out. Two cubes of lead, having edge dimensions of 2.35 inches, were compressed in a pressure testing machine. One cube was guided on two opposite sides, and was allowed to be deformed laterally in only one direction. In order to eliminate friction, the supported sides were well lubricated with oil. The other cube was loaded, and was left free to be deformed in any direction. The following values were obtained:

Compression	Load on supported cube, pounds	Load on free cube, pounds
0.079	4400	6600
0.098	5950	7700
0.123	7050	8350

The average of the ratio between these values is 1.3. According to the examples previously calculated, the ratio has been computed as 1.88/1.39 = 1.35. This checks remarkably well.

A cube that is not supported laterally should be deformed in only one

direction, in accordance with the principles of least resistance. This is not possible, however, because the pressure acts equally in both directions.

According to equations (29) and (24), the total pressure for parallelopipedal deformation will be:

$$p=\sigma+p\eta=2t+\eta\frac{v_h}{h}=\sigma+\epsilon\frac{v_h}{h}\ldots(30).$$

(To be continued)

Improves Wire Baker Economy with Refractory Combustion Chamber

IN the manufacture of steel wire, the wire rods as they come from the rolling mill are coiled up into bundles, are pickled and rinsed, and then placed on a revolving frame and sprayed with water to form a rust coat on the surface which later acts as a slight lubricant in the wire drawing operations. The last traces of acid are eliminated by treatment in a lime bath, after which the bundles are piled on buggies and pushed into a wire baker to be dried or baked at a low temperature. This treatment expels most of the hydrogen occluded due to action of the acid, the presence of which causes acid brittleness.

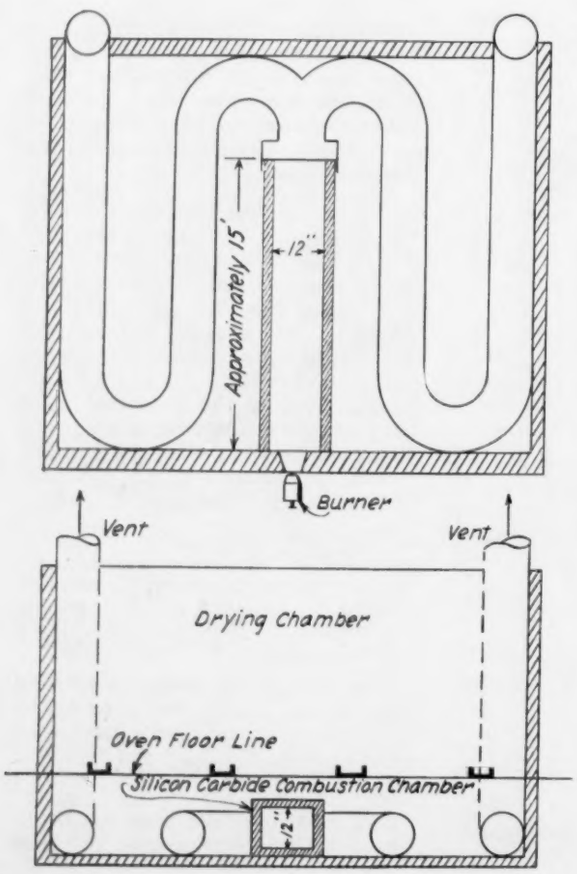
The wire baker is an oven heated by oil or gas to a temperature of 450 to 500 degrees Fahr. The working floor of the oven is at floor level while firing takes place in a space below the working floor, as shown in the accompanying illustration. Combustion is confined to a horizontal chamber in the neighborhood of 15 feet long; the remainder of the heating surface consisting of two U-shaped sections of pipe or duct connected at one end to the combustion chamber and at the other end to vents. The heat thus generated passes through the floor of the baker into the drying chamber and circulates around the buggies of wire.

Castings Show Warpage

Several eastern plants manufacturing high-carbon wire and operating oil-fired bakers until recently were utilizing as combustion chambers trenches covered with gray-iron castings. These castings soon warped and permitted leakage from the chambers into the ovens, consequently causing spoilage of the wire rods. A later development involved firing into a heavy cast-iron pipe, but this arrangement, while solving the leakage difficulties, was very costly to maintain because of the short life of the pipe.

A solution was found by substituting the first 15 feet of cast-iron pipe with a refractory combustion chamber supplied by the Carborundum Co., Perth Amboy, N. J. In this application, the chamber consists of a rectangular cross section duct 12 x 12 inches inside diameter and approximately 15 feet long formed from tongue and grooved silicon carbide tile. This combustion chamber is known as the Carboradiant type and the tile as Carbofrax.

Because of the high thermal conductivity of the tile, nearly as much heat is said to be radiated from this combustion chamber as was derived formerly from the cast-iron pipe, and the tile easily withstands the service conditions. The temperature of the gases is so reduced in the chamber that the discharge end can be connected to ordinary galvanized steel pipe for the additional heating surfaces.



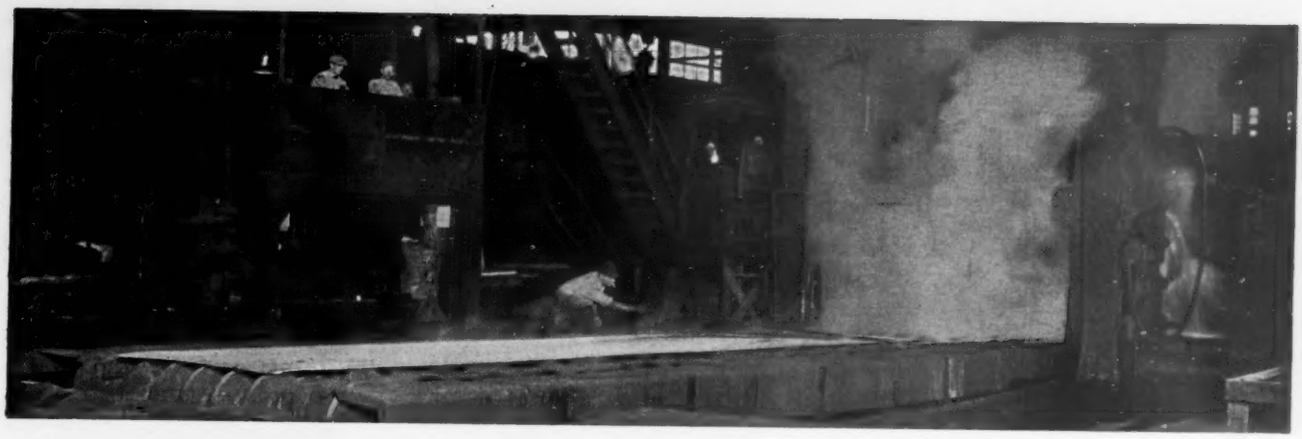
SKETCH showing the heating arrangement of a wire baker equipped with a refractory combustion chamber. This chamber, 12 x 12 inches dimensions and 15 feet long, is made from tongue and grooved silicon carbide tile. The plan view is shown above and the end elevation below

Beer Barrel Is of Welded Steel

IN PRODUCTION the past three years for export, a composition-lined steel beer barrel is now announced available for domestic use by the Geuder, Paeschke & Frey Co., Milwaukee. Shown in section in the accompanying illustration, the barrel is

of electrically welded seamless construction with rounded corners and smooth surfaces, reinforced at the middle by extra thicknesses of steel. Exterior surface is hot galvanized after completion to prevent rusting and can be annealed, lacquered or aluminized if desired.

Lining is a composition material known as Mammut, manufactured by A. Gusmer Inc., and has been used in brewery tanks and vats for years.



PROGRESS IN STEELMAKING

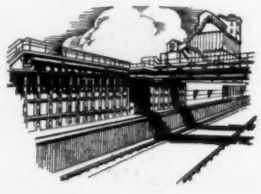
CUTTING buttweld tubes coming from the mill in short lengths without interference is accomplished by a producer in the Pittsburgh district by a novel arrangement. As the tubes progressing away from the mill arrive opposite the cooling bed, they are transferred broadside to the bed by pivoted arms. The latter are mounted with their axes perpendicular to the 8-degree guide surface and are built with a pivoted yoke at the lower end of the axle which can be swung out of the way. Swinging the deflecting arms away from the path of travel, affords cutting the tubing into short multiple lengths to meet certain specifications. Since no lifting of the tubes is necessary in effecting the transfer, no bending occurs.

♦ ♦ ♦

Addition of a single drop of oil on the roll neck rests of roll grinding machines frequently effects a material change in the character of the grinding operation.

♦ ♦ ♦

High percentage of recovery in leveling of imperfect sheets was recorded recently at a tin mill in the Pittsburgh district. With the use of a new type sheet leveler, approximately 80 per cent of its mill discards were reclaimed.



INTERESTING results are expected to come from an experiment tried by the by-product division of a steelmaker in the Pittsburgh district. About six months ago owing to depressed economic conditions, it was decided to fill the by-product ovens at the works with ashes, hoping to keep them warm and yet do away with a fuel bill. The ovens were filled completely with ashes and sealed over the top with tar. To further prevent moisture seeping through, a heavy coating of asphalt was placed over the top of each oven. Now with demand for by-product coke resuming, and many blast furnaces having been blown in, workmen began operations recently by hand to excavate the asphalt, tar and ashes at the by-product works. The work has not yet been completed, but interesting developments as to the status of the brick lining of the ovens are expected to result.

FURNACE glaze or a vitrified coating has been developed for refractory walls of heating furnaces. The product fuses progressively between 1200 and 2800 degrees Fahr. and does not re-fuse or run at much higher temperatures.

♦ ♦ ♦

Ingot structure of deep drawing steel is highly satisfactory when the level of the steel in the molds drops slightly, say 1 inch after topping off and before starting to rim, according to the practice of a steelmaker in the Great Lakes district.

♦ ♦ ♦

Application of a recently devised protective coating to rust-pocked surfaces, in doors or out, is claimed to prime, protect and decorate in one operation. The coal-tar-naphtha base penetrates the rust, pores and crevices, while the aluminum flakes, mixed prior to using, comes to the surface and provides a decorative surface. The coating dries by evaporation and is said to have stability of protective qualities after long exposure to acids, alkalies and moisture. The product, which may be sprayed or brushed, withstands temperature changes, vibration and reasonable bending without chipping or peeling.

♦ ♦ ♦

High tungsten content is one of the features of a newly marketed cutting alloy which is fusion welded to steel shanks in a variety of tool shapes. Tests show that on a 3 per cent nickel case-hardening steel with a tensile strength of 35 tons and a brinell hardness of 153, a rough turning speed of 170 feet per minute is possible on bars.

♦ ♦ ♦

Power loss at electric furnace electrode clamps may offset the savings attainable by using high-current-density electrodes unless the contact resistance is held down, according to a recent investigation. A bronze clamp lining, which yields to the shape of the electrode, has been found superior to an unlined steel clamp in this connection. The resistance of the electrode clamp contact may be more important than that of the busbars and electrodes. This phase often is neglected because of the water cooling.

LESS erosion from slags and a material increase in ladle life are obtained by lining steelworks ladles with circle brick laid without an overhanging ledge, according to the practice of a Pittsburgh district open-hearth shop.

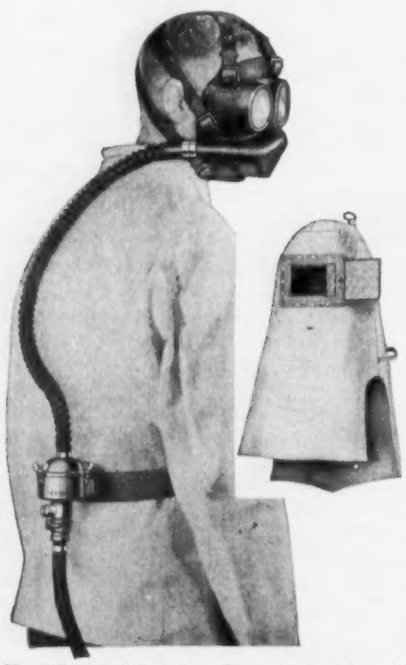
NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Sand Blast Mask Protects Workers From Dust

Chicago Eye Shield Co., 2302 Warren boulevard, Chicago, recently designed a mask for sand and shot blasting and other occupations where harmful dusts are encountered. When in position the face piece of the mask is covered by an outer hood, both of which are shown herewith. The mask consists of a soft molded rubber face piece which adapts itself to any facial contour.

Attached to the side of the face piece is a rubber tube, the lower end of which connects with the air filter attached to an adjustable belt. Air under pressure enters the filter, foreign particles are removed, and clean air is carried to the face piece. Exhaled air is released by means of an exhaust valve.



Healthguard hood and mask developed by Chicago Eye Shield Co.

◆

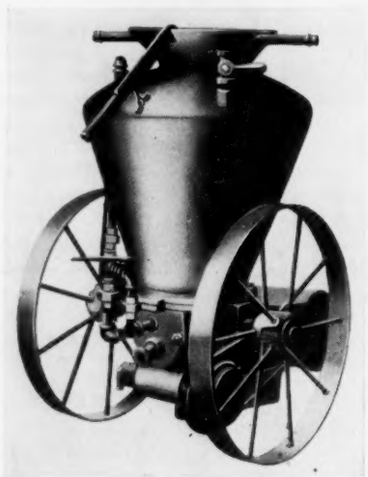
Introduces Wheel Cutters For Tubing, Pipe

Borden Co., Warren, O., recently placed on the market a tubing cutter for ⅛ to ¾-inch sizes, and a Square-built wheel cutter for 2½ to 4-inch pipe sizes. The tubing cutter produces clean square ends without crushing tubing with thin walls, and has a renewable blade reamer. Beaver Square-built wheel cutters have frames which are ground to establish true parallel working surfaces as the foundation to subsequent machining operations. Wheels and rollers are standard.

◆

Machine Applies Materials By Compressed Air

Gunitor Co., 1227 Beardsley avenue, Elkhart, Ind., is manufacturing a machine for pneumatically applying concrete, cement mortar, refractory material, etc. The unit, shown herewith can be controlled by one man at the nozzle. Use of an electric motor on some models permits remote control. Material is "shot on" by compressed air, packing it densely. Handled through the hose dry, the material is suspended in the high pressure air which carries it to the nozzle where it is mixed with water. Proper hydration is under constant control of the nozzle man.



Gunitor unit for applying cementing or refractory material

◆

Thickness Gage Automatic In Operation

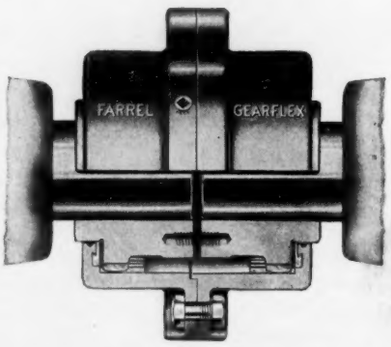
Federal Products Corp., 1144 Eddy street, Providence, R. I., recently introduced a model 644 thickness gage, shown in the accompanying illustration. A feature of construction permits clamping the material being gaged before the measuring anvils come in contact with the work. The unit has two ¾-inch diameter aligning surfaces; in the center of the lower one is the stationary gaging point and in the upper the point making direct contact with the dial indicator. Operation of the gage is entirely automatic and consequently does not require the services of an experienced inspector.

Thickness gage designated model 644, marketed by Federal Products Co.

◆

Flexible Coupling Made In Two Types

Farrel-Birmingham Co. Inc., 344 Vulcan street, Buffalo, has placed on the market a new flexible coupling of the gear type. The double engagement design illustrated below, consists essentially of two externally geared hubs keyed to the two shafts to be connected, and engaging an internally geared floating sleeve which encases the two hubs. With two sets of spur gears, one on each end of the floating sleeve, misalignment is compensated for by the sleeve assuming a neutral position between the two shafts. A reservoir between the hubs and the floating sleeve carries the supply of lubricant, centrifugal force distributing the oil.



Farrel-Birmingham flexible coupling is gear type unit

Specifying Cuts Backlogs as New Orders Fail

Steel Rate Off 1 Point to 41%—Further Delay in Prices—Bar, Shape, Plate Levels Withdrawn in East—More Railroad Nibbles—Piling for Breakwaters Aids Structurals

EITHER for current requirements or for stocking, consumers of steel continue to specify fully against expiring third quarter contracts, but with equal unanimity they refrain from any commitments for the fourth quarter.

These specifications were broad enough to restrict the decline in steel production last week to 1 point, leaving the national average 41 per cent. In fact, operations were stepped up in four districts and held stationary in four.

But, this unbalanced market situation is rapidly draining backlogs away, and unless there is a reversal in the next ten days the mills will enter the last quarter practically devoid of orders, with a consequent further break in activity. Sentiment weakened perceptibly last week.

For this stalemate, the confused situation arising from the new steel code is partly responsible. An expected clarification failed last week when important eastern mills withdrew their official fourth quarter quotations on bars, plates and shapes, and further delay was encountered in filing new schedules on other products and in agreeing upon an allowance for trucking.

At the same time, the base of the market structure remained too narrow. Tin plate specifications for November, entered last week, indicate no noticeable weakness, but the seasonal blank in automotive requirements, due to changes in models, is at hand. Except for a few flickers of business from the railroads and for government building projects, reinforcements are not at hand.

Sheets and bars are the busiest departments of the industry, largely traceable to automotive releases. A 3400-ton order for 10-inch gas pipe was divided between Jones & Laughlin and Spang-Chalfant. Actual structural steel awards last week, totaling 11,893 tons, were short of the weekly average for 1933.

A slight stir in railroad participation in the market developed when the Pennsylvania asked bids, closing Sept. 28 and 29, on 12,000 tons of various products. The Chesapeake & Ohio is about to place 8000 tons of fastenings to accompany its recent rail order. The New York Central has authorized 10,000 tons of rails and released 2000 tons.

Federal work looms increasingly in structurals, 14,000 tons of piling and 3500 tons for bridges being up at Chicago. Bids are in on 13,000 tons for Grand Island bridges at Buffalo.

Pig iron is moving well in all districts, chiefly against contracts entered prior to the recent advances. New quotations on ferromanganese are expected this week.

Coke is being strengthened by the coal miners' "holiday" in western Pennsylvania, asking prices on beehive foundry being up 25 cents. By-product coke has risen 50 cents in the East.

A Pittsburgh mill broke the deadlock in steel scrap by a purchase at $13, followed by one at $12.50, lowering the market to $12.50 to $13. Most melters are willing only to take in distress lots, at distress prices.

When Bethlehem withdrew its fourth quarter schedule on bars, plates and shapes, some other producers followed. Developments are being watched closely. Some makers of wire have extended current prices; others have not acted. Wire rods have been reaffirmed at $35.

New extras include four quantity differential brackets for hot and cold-rolled seamless boiler tubes, and on mixed and joint cars of wire products. Processing extras on wire are revised.

By districts, steel operations last week were: Pittsburgh, unchanged at 35 per cent; Chicago, off 5 points to 40; eastern Pennsylvania, down 1½ to 35½; New England, up 11 to 96; Detroit, unchanged at 55; Birmingham, steady at 50; Buffalo, off 3 to 45; Cleveland, up 4 to 60; Wheeling, unchanged at 75; Lorain, up 17 to 83; Youngstown, up 1 to 46.

STEEL's iron and steel index was stationary at $31.23, finished steel at $48.30; scrap off 12 cents to $10.88.

Composite Market Averages

	Sept. 16	Sept. 9	One Month Ago Aug., 1933	Three Months Ago June, 1933	One Year Ago Sept., 1932	Ten Years Ago Sept., 1923
Iron and Steel Composite	$31.23	$31.23	$30.04	$28.73	$29.32	$44.64
Finished Steel Composite	48.30	48.30	47.50	45.30	47.50	68.05
Steelworks Scrap Composite	10.88	11.00	11.57	9.55	7.04	16.15

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Sept. 16, 1933	Aug. 1933	June 1933	Sept. 1932
Pig Iron				
Bessemer, del. Pittsburgh	19.26	18.26	17.26	15.76
Basic, valley	17.00	16.00	15.00	14.00
Basic, eastern, del. eastern Pa.	18.19	17.38	16.19	13.75
No. 2 foundry, del. Pittsburgh	18.76	17.76	16.76	15.76
No. 2 foundry, Chicago	17.50	17.00	16.00	15.50
*Southern No. 2, Birmingham	13.50	13.00	12.00	11.00
**No. 2X, Eastern, del. Phila.	18.63	17.88	16.76	14.26
Malleable, valley	17.50	16.50	15.50	14.50
Malleable, Chicago	17.50	17.00	16.00	15.50
Lake Superior charcoal, del. Chi.	23.54	23.04	23.04	23.04
Gray forge, del. Pittsburgh	18.38	17.13	16.63	15.63
Ferromanganese, del. Pittsburgh	87.24	87.24	73.24	73.24

*1.75-2.25 silicon. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	2.50	2.75	1.80	2.00
Connellsville, foundry, ovens	3.25	3.10	2.40	2.75
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	26.00
Wire rods, Pittsburgh	35.00	35.00	35.00	37.00

	Sept. 16, 1933	Aug. 1933	June 1933	Sept. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.60
Steel bars, Chicago	1.65	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.91
Iron bars, Chicago	1.60	1.65	1.65	1.65
Shapes, Pittsburgh	1.60	1.60	1.60	1.60
Shapes, Philadelphia	1.81 ½	1.81½	1.65	1.75
Shapes, Chicago	1.65	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.55	1.60
Tank plates, Philadelphia	1.79 ½	1.79½	1.49½	1.79½
Tank plates, Chicago	1.65	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.65	1.65	1.65	1.70
Sheets, No. 24, hot ann., Pitts.	2.25	2.25	2.10	2.10
Sheets, No. 24, galvan., Pitts.	2.85	2.85	2.70	2.75
Sheets, No. 10 blue anneal., Gary	1.90	1.95	1.95	1.85
Sheets, No. 24 hot ann., Gary	2.35	2.40	2.40	2.25
Sheets, No. 24 galvan., Gary	2.95	3.00	3.00	2.90
Plain wire, Pittsburgh	2.10	2.10	2.10	2.20
Wire nails, Pittsburgh	2.10	2.10	1.85	1.95
Tin plate, per base box, Pitts.	4.65	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$12.75	13.75	11.65	9.50
Heavy melting steel, eastern Pa.	11.00	12.00	9.50	7.25
Heavy melting steel, Chicago	10.00	10.40	9.25	5.75
No. 1 wrought, eastern Pa.	11.50	13.00	10.25	7.25
No 1 wrought, Chicago	9.25	10.35	8.10	5.60
Rails for rolling, Chicago	11.25	11.25	10.25	7.00

CURRENT FINISHED STEEL PRICES

Prices revised, so far as possible, in conformity with new institute schedules. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base	1.65c to 1.75c
Gary, base	1.75c
Chicago, del.	1.785c
*New York, del.	2.00c to 2.10c
Birm., base	1.80c
*Phila., del	1.96c to 2.06c
*St. Louis, del.	2.09c

HOT ROLLED ANN. No. 10

Pittsburgh, base	1.80c to 1.90c
Gary, base	1.90c
Chicago, del.	1.935c
*Phila., del.	2.11c to 2.21c
*New York, del.	2.15c to 2.25c
St. Louis, del.	1.99c
Birm., base	1.95c
*F.o.b. dock, Pacific ports	2.32½c

HOT ROLLED ANNEALED No. 24

Pittsburgh, base	2.25c
Gary, base	2.35c
Chicago, del.	2.385c
New York, del.	2.60c
Phila., del.	2.56c
Birm., base	2.40c
St Louis, del.	2.59c
*F.o.b. dock, Pacific ports	2.95c

GALVANIZED No. 24

Pittsburgh, base	2.85c
Gary, base	2.95c
Chicago, del.	2.985c
Phila., del.	3.16c
New York, del.	3.20c
Birm., base	3.00c
St. Louis, del.	3.19c
*San Fran., f.o.b.	3.55c

TIN MILL BLACK No. 28

Pittsburgh, base	2.50c
Gary, base	2.60c
St. Louis, del.	2.84c

COLD ROLLED No. 10

Pittsburgh, base	2.30c
Gary, base	2.40c
Philadelphia, del.	2.61c
New York, del.	2.65c

COLD ROLLED No. 20

Pittsburgh, base	2.75c
Gary, base	2.85c
Philadelphia, del.	3.06c
New York, del.	3.10c

ENAMELING SHEETS

Pitts., No. 10	2.40c to 2.45c
Pitts., No. 20	2.90c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract	$4.65
Do., stock	4.05
Long ternes, No. 24 unassorted	2.90c

Gary base, 10 cents higher.

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.60c
New York del.	1.90c
Phila., del.	1.79½c
Boston, del.	2.02c
Buffalo, del.	1.85½c
Chicago, base	1.65c
Cleveland, del.	1.80½c
Birmingham, base	1.75c
Coatesville, base	1.70c
Sparrows Point, base	1.70c
Pac. Coast, f.o.b.	2.15c
*St. Louis, del.	1.89c

Structural Shapes

Pittsburgh, base	1.60c
Philadelphia, del.	1.81½c
New York, del	1.87c
Boston, del.	2.00½c
Bethlehem base	1.70c
Chicago, base	1.65c
Cleveland, del.	1.80½c
Lackawan., base	1.70c
Birmingham, base	1.75c
Pac. Coast, f.o.b.	2.15c
Do., wide flange	2.25c

Bars

SOFT STEEL

Pittsburgh, base	1.60c
Chicago, base	1.65c
Birmingham, base	1.75c
Lackawan., base	1.70c
Pacific Coast ports, c.i.f.	2.10c
Cleveland, base	1.65c
Philadelphia, del.	1.91c
New York, del.	1.95c
San Fran., f.o.b.	2.15c
Pitts., forg. qual.	1.75 and 1.85c

RAIL STEEL

*Pittsburgh, base	1.50c
*Chicago	1.55c

IRON

Chicago, base	1.60c
Philadelphia, base	1.60c
Pitts., refined	2.70c to 4.20c

REINFORCING

New billet steel, Chi., Young., Buff., Cleve., Birm. (cut lengths	1.95c
Pitts., cut lengths	1.90c
Rail steel, Chi.	1.80c
Phila., cut lengths	2.21c
Phila., rail steel	2.06c
San Francisco	2.35c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher; joint carloads up 20 cents; less carloads up 30 cents. Nail extras subject to 10 per cent discount on straight or mixed carload shiped to single consignee.)

F.o.b. mills, 100 lb. keg

Standard wire nails	$2.10
Cement coated nails	2.10
Galvanized nails	3.60

(Per pound)

Polished staples	2.80c
Galvanized fence staples	3.05c
Barbed wire, gal.	2.60c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.)	$55.00

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.10c

Anderson, Ind., and Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Spring wire	3.10c

Chicago and Waukegan $1 higher, Worcester $2 higher.

Cold-Finished Bars

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Chicago, Cleveland and Buffalo 5c higher.

Shafting

(Turned and ground)
Cumberland, Md., base

1⅛-inch	3.25c
1 3/16 to 1½-inch	2.75c
1 9/16 to 1⅞-inch	2.60c
1 11/16 to 2⅞-inch	2.45c
2 13/16 to 6-inch	2.30c

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O., 2.45c. F.o.b. Bethlehem, Pa., 2.55c.
Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20

4100 .15 to .25 Mo	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	0.20
6100 bars	1.20
6100 spring	0.95
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 (flats)	0.25
9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16-in. wide, Pitts.	1.65c to 1.75c
Do., Chicago	1.75c to 1.85c
Do., del. Phila.	1.96c to 2.06c
Do., del. N. Y.	2.00c to 2.10c
Cooperage hoop, Pittsburgh	1.75c to 1.85c
Do., Chicago	1.85c to 1.90c
Cold-rolled strip Pitts., Cleve.	2.25c to 2.40c
Worcester, 3 tons or over	2.45c to 2.60c

Rails, Track Material

Stand. rails, mill	$40.00
Relay rails, Pitts. (Gross Ton)	
20-45 lbs.	$24.50
50-75 lbs.	$20.00
80-100 lbs.	$23.50
*Light rails, billet qual., Pitts.	$32.00
*Do., reroll. qual.	$31.00
Angle bars, mills	2.55c
Spikes, R. R., Pitts.	2.40c
Track bolts, base	3.40c
Tie plates, Pitts.	1.90c
Tie plates, Chi.	1.90c

Base, railroad spikes 200 kegs or more; base tie plates, 20 tons or more; differentials for less.

Base, light rails, 25 to 40 pounds; 50 to 60 pounds inclusive, $5 extra; 16 and 20 pounds, $1 extra; 12 pounds, $2 extra; 8 and 10 pounds, $5 extra.

Rivets, Wrought Washers

Struc. c.l., Pitts-Cleve.	2.50c
Struc., c.l., Chi.	2.60c
7/16-in. & smaller, Pitts., Chi., Cleve.	70, 10 and 5 off
Washers, c.l., Pitts. and Chicago	6.25 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots, Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off
Rolled thread, ½ x 6 and smaller	73 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	73 off
Tire bolts	60 off
Stove bolts, 72½-25-10 off in pkgs.; 85 off in bulk, 5000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller, 73 off.	
Step Bolts	70 off
Elevator bolts	70 off

NUTS

Semifinished	73 off

HEXAGON CAP SCREWS

Milled	85 off
Upset 1-in., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	80 off
Upset, larger than 1-in.	80 off
Headless set screws	75-10 off

Cut Nails, Piling

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more; no discount on size extras	$3.00
Do., less than 5 kegs; no discount on size extras	$3.15
Steel piling, Pitts.	1.90c
Steel piling, Buff.	2.00c
Steel piling, Chi.	2.00c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

Steel

In.	Blk.	Gal.
¼ and ⅜	57	38½
½	62	50½
¾	65½	55½
1—3	67½	58½

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

Steel

2	63½	54½
2½—3	66½	57½
3½—6	68½	59½
7 and 8	67½	57½
9 and 10	67	57

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½
9—12	38	24½

LINE PIPE

Steel

⅛-inch, butt weld	50½
¼—⅜, butt weld	56
½, butt weld	61
¾, butt weld	64½
1—3, butt weld	66½
2-inch, lap weld	62½
2½—3, lap weld	65½
3½—6, lap weld	67½
7—8, lap weld	66½
9—10, lap weld	66
11—12, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe list. 8—12 inch no extra. 2-inch line discount unchanged from list prior to April 15, 1933.

BOILER TUBES

C. L. Discounts, f.o.b., Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3¾	50	3	17
4	52	3¾—3½	18
4½—6	42	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts, same as for hot rolled below. Charcoal Iron—Under 10,000 pounds; 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

Cold Drawn

2—2¼	27	3¼—3½	44
2½—2¾	34	4	46
3	41	4½, 5, 6	36

(On 1—1¾-inch sizes mechanical tubing discounts apply.)

Hot Rolled

2—2¼	33	3¼—3½	50
2½—2¾	40	4	52
3	47	4½, 5, 6	42

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	40%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$35.00-36.00
4-in., Birm.	38.00-39.00
4-in. Chicago	46.40-47.40
6 to 24-in. Chicago	43.40-44.40
6-in. & over, N. Y.	34.50-36.50
4-in. New York	36.50-38.50

Class A pipe $3 over Class B. Stand. fitgs., Birm. base..$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

RAW MATERIAL PRICES

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.30
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	8.00- 9.00
Cop-free low phos. 58-65% (nom.)	10.00-10.50

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.50

(*Please turn to next page*)

No. Afr. low phos.	7.00
Swedish basic, 65%	8.00
Swedish lo wphos.	8.50
Spanish, No. Afr. basic, 50 to 60%..	7.00
Tungsten, spot, sh. ton unit, duty pd.	$12.00-12.50
N. F. fdy., 55%.....	7.00
Chrome ore, 48% gross ton c.i.f.	$17.00-18.00

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasion, 52-55%	22.00
So. African, 52%..	21.00-22.00
So. Afr., 49-51%....	20.00-21.00
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ohio, Ill., Ky., Md., Mo., Ga., Ala.	40.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet E. Chicago ..	54.00
Birmingham, Ala....	55.00

MAGNESITE BRICK

Per Net Ton, 9 x 4½ x 2½

Burned	$65.00
Unburned	55.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point....	$45.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

Fluorspar

85 to 5 per cent grade

Washed gravel, duty paid, tide, gross ton	$20.00
Washed gravel f.o.b. Ill., Ky., net ton, carloads	$14.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00
Canton, O.	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts....	1.60c

Coke

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.....	$2.50- 2.75
*Connellsville fdry..	3.25- 3.50
Connell. prem. fdry.	4.50
New River fdry.....	6.00
Wise county fdry..	4.25- 5.00
Wise county fur.....	3.50- 4.25

BY-PRODUCT FOUNDRY

*Newark, N. J., del.	8.71- 9.31
Chi. ov., outside del.	8.00
Chicago, del.	8.75
*New England, del.	10.50
St. Louis, del.	8.25
Birmingham, ovens	4.50
Indianapolis, del. ..	8.75
Ashland, Ky., Connells., basis	5.50
Portsmouth, ovens, Connell. basis	5.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd.	82.00
del. Pitts.	87.24
Spiegeleisen, 19-20%, dom., fur., spot†..	27.00
Ferrosilicon, 50%, frieght all., c. l.....	74.50
Do, less carload..	82.50
Do, 75 per cent....	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.....	1.04 -1.10
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton....	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn.. basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Pig Iron

(Delivered prices do not include switching charges, except as noted, or freight surcharges. 25-cent differentials apply for each 0.25 silicon above 2.25.)

Gross Tons

	No. 2 Fdry.	Malleable	Basic	Bessemer
Basing Points:				
Bethlehem, Pa.	$17.50	$18.00	$17.00	$18.50
Birdsboro, Pa.	17.50	18.00	17.00	18.50
Swedeland, Pa.	17.50	18.00	17.00	18.50
Sparrows Point, Md.	17.50	18.00	17.00	18.50
From Swedeland, Pa., del. to Phila.	18.26	18.76	17.76	.....
Basing Points:				
Everett, Mass	18.00	18.50	17.50	19.00
From Everett, del. to Boston, flat rate, with surcharge	19.00	19.50	18.50	20.00
Buffalo	17.50	18.00	16.50	18.50
Buffalo, del. to Boston	19.00	19.50	18.50	20.00
Bethlehem, del. to Brooklyn	19.77	20.27	.....	.....
Bethlehem, del. to Newark, N. J.	18.99	19.39	.....	.....
Basing Points:				
Neville Island, Pa.	18.00	18.00	17.50	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown, O.	17.50	17.50	17.00	18.00
From Neville Island, Pa., del. to Pittsburgh	(Neville Island base, plus 50 to 76 cents switching charges)			
Basing Points:				
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, O.	17.50	17.50	17.00	18 00
Detroit	17.50	17.50	17.00	18.00
From Detroit, del. to Saginaw, Mich.	19.60	19.60	19.10	20.10
From Cleveland, del. to Akron, Canton, O.	18.76	18.76	18.26	19.26
From Toledo, del. to Mansfield, O...	19.26	19.26	18.76	19.76
Basing Point:				
Hamilton, O.	17.50	17.50	17.00	18.00
From Hamilton, del. to Cincinnati	18.51	18.51	18.01	19.01
Do., del. to Indianapolis	19.77	19.77	19.27	20.27
Basing Points:				
Duluth	18.00	18.00	.....	18.50
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	.....
From Duluth, del. to St. Paul	19.94	19.94	.....	20.44
From Chicago, del. to Milwaukee..	18.50	18.50	18.00	19.00
From Chicago, Toledo or Detroit, del to Muskegon, Mich.	20.40	20.40	19.90	20.90
From Granite City, del. to St. Louis	(Granite City base, plus 56 to 75 cents switching charges)			
Basing Point:				
Birmingham, Ala.	13.50	.....	12.50	.....
*Boston	18.62	.....	18.12	.....
*Newark, N. J.	18.51	.....	.....	.....
*Brooklyn, N. Y.	19.39	.....	.....	.....
*Philadelphia	17.88	.....	17.38	.....
*Baltimore	18.02	.....	17.52	.....
Cleveland	19.64	.....	18.64	.....
Cincinnati	18.23	.....	17.11	.....
Chicago	18.16	.....	19.14	.....
St. Louis	18.05	.....	17.05	.....
Basing Point:				
Provo, Utah	16.50	.....	.....	.....

LOW PHOS.

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$22.00. Basing point: Johnson City, Tenn.—.....

Philadelphia, standard and copper bearing..... 23.13

GRAY FORGE

Valley furnace	17.25
Pittsburgh, district furnace	17.75

CHARCOAL

Lake Superior, furnace	20.50
Do., del. Chicago	23.54

SILVERY

Jackson County, O., base: 6%—$22.25; 7—$23.25; 8—$24.25; 9—$25.25; 10—$26.25; 11—$27.75.

BESSEMER FERROSILICON

Jackson County, O., base: 10%—27.25; 11—$28.75; 12—$30.25; 13—31.75; 14—$33.25; 15—$34.75; 16—$36.25.

Bars

Little Interest Shown by Users In Fourth Quarter—Automotive Needs Are Help

BAR PRICES, PAGE 36

Pittsburgh—Miscellaneous demand for bars showed some life last week after many weeks of decline and two or more preceding weeks of absolute quiet. Part of this business is from automobile manufacturers covering material for new models. Markets on bars, all Pittsburgh bases, are as follows: carbon bars, 1.60c; alloy bars, 2.45c; commercial quality forging bars, 1.85c; and special quality forging bars, 2.10c.

Cleveland—Some leading producers as late as last Friday were not committing themselves on heavy finished steel prices for fourth quarter. Instructions were to refer all inquiries to headquarters, though there were few, if any, inquiries. Some interests a week ago announced their intention to reaffirm their current prices, including 1.60c, Pittsburgh, and 1.65c, Cleveland, on commercial steel bars. Sellers here say no orders have yet been placed for fourth quarter. Shipments to automotive, railroad and other consumers will continue to Sept. 30 on third-quarter contracts, the majority of which were placed at lower figures than now prevailing.

Chicago—While steel bar sales and specifications were slightly heavier the past week, they were lighter than during the peak July period. Closing out of old contracts helps shipments but interest in fourth quarter contracts is limited. Shipments to the automotive industry are well maintained; releases have not been received on material for new models. The 1.65c, Chicago, price is quoted on fourth quarter business.

Boston—Commercial steel bars, alloy and forging bars are in small demand, with 1.60c, Pittsburgh, reaffirmed for fourth quarter. Bolt and nut manufacturers are less active, placing only small orders, as needed.

New York—Little contracting for fourth quarter has developed at the reaffirmed price of 1.60c, Pittsburgh, for commercial steel bars. While there may be an advance later, consumers feel little incentive for buying on this score, for when they do buy they must specify a specific tonnage within specific time limits and most believe that the 10-day clause under which changes must be filed with the American Iron and Steel institute, will provide them sufficient warning should an advance take place. Some of the more specific requirements of the railroads for delivery after Sept. 30 are expected out within the next week or 10 days.

Cold-Finished Is Dull

Cold Finished Prices, Page 37

Pittsburgh — Determination of fourth quarter market on cold-finished steel bars will be made early this week. In the meantime 1.95c, base, Pittsburgh, continues for at least to Sept. 30. Bases on turned and ground shafting continue as of the advance from Aug. 1. Specifications for cold-drawn bars to be used in parts for 1934 automobiles are beginning to appear but no tonnage purchases are being made and the market is slow.

Tin Mills at Capacity; Black Extras Being Prepared

Tin Plate Prices, Page 36

Pittsburgh — Canmakers issued their November tin plate specifications up to the close of last week and specifying against old contracts still is heavy. New buying at $4.65 per base box is light. Certain extras, including drawing, are being worked out on tin mill black sheets and a revised extra card is expected. Capacity operations continue in tin plate producers' plants in this district and promise to continue for the balance of the year. The market on tin mill black sheets still is based on 2.50c, Pittsburgh.

Plates

Users Slow to Contract for Future Needs—Protections Now Of Limited Nature

PLATE PRICES, PAGE 36

Pittsburgh—The plate market is quieter, although small orders show little change. The absence of river barge orders still is felt but several orders may develop with completion within a few months of the Winfield, W. Va., locks. This will permit heavier coal traffic on the Big Kanawha river and several transportation companies are known to have inquiries for barges depending upon this facility. Pittsburgh-Des Moines Steel Co. has closed on the 60-ton standpipe for Etna, Pa. The price of plates is 1.60c, Pittsburgh, through fourth quarter. Wheeling Steel Corp., Wheeling, W. Va., will place its Ohio river steamer La Belle on the docks soon to construct a steel hull.

Cleveland—Plates currently are 1.60c, base, Pittsburgh, with some makers as yet undetermined on price for fourth quarter. Consumers are reluctant to contract and some are asking for letters of "protection" at the current price for 30 days or more, unaware that "protections" no longer will be given, except for specific work. Where fabricators must know the price in advance of bidding, they may be guaranteed a price for a limited period, and in the event their bid is not successful the material cannot be taken and diverted to another purpose. Two Great Lakes lighthouse tenders, bids Sept. 20, will take 650 tons of steel, mainly plates.

Chicago—The largest project in new plate work is a dam facing at Chama, N. Mex., requiring 1150 tons. Business from oil companies continues quiet and railroad requirements slow. Plates continue 1.65c, Chicago.

Boston—Current buying of steel plates has been light at 1.70c, Coatesville, Pa., and practically no fourth quarter business has been placed. New York, New Haven & Hartford has placed 100 tons for locomotive repairs.

New York—Eastern plate producers are opening books for fourth quarter at 1.70c, Coatesville, Pa., and Sparrows Point, Md. Specifications are better than anticipated, due largely, it is believed, to desire if consumers to lay in stocks before the beginning of next quarter. While the base price for next quarter is unchanged, the more rigid applications of extras, such as even now apply on new business, will mean higher prices in a number of instances. Fourth quarter buying is negligible.

Philadelphia—Some eastern plate mills have not yet formally opened books for fourth quarter. Operations are lower, reflecting dimin-

ished demand. Navy work is expected to bring improvement soon.

Contracts Placed

800 tons, barges for Lester F. Alexander, New Orleans, to Ingalls Iron Works, Birmingham, Ala.

500 tons, caisson dredging wells for Pier E-3, east bay substructure, San Francisco-Oakland bridge, to Berkeley Steel Construction Co., Berkeley, Calif.

450 tons, molasses tanks, Merrimac Chemical Co., Everett, Mass., to Chicago Bridge & Iron Works, Chicago.

439 tons, navy, for Panama, divided between Worth Steel Co., Claymont, Del., and Central Iron & Steel Co., Harrisburg, Pa.

300 tons, tanks for Union Oil Co., Oleum, Calif., divided between Steel Tank & Pipe Co. and Berkeley Steel Construction Co., both of Berkeley, Calif., and Western Pipe & Steel Co., San Francisco.

210 tons, navy, for Mare Island, Calif., to Youngstown Sheet & Tube Co., Youngstown, O.

160 tons, state of Washington for auto license plates, to Seattle Hardware Co., Seattle.

Contracts Pending

6000 tons, navy, Washington, destroyers; bids Sept. 12.

3000 tons, ship for Swayne & Hoyt, San Francisco; Gulf Industries Inc., Pensacola, Fla., low.

1200 tons, two destroyers, Mare Island, Calif.; bids Sept. 12.

1200 tons, mostly plates, three cutters, United States coast guard; bids Oct. 9

1150 tons, dam facing, Chama, N. Mex.

650 tons, mainly plates, two Great Lakes lighthouse tenders; bids at Washington, Sept. 20.

Bolt, Nut Needs Light; Price for Only 30 days

Bolt, Nut, Rivet Prices, Page 37

Pending acceptance of their code manufacturers of bolts and nuts are opening books for contracts for 30 days from Sept. 30, instead of for fourth quarter, with prices unchanged from current levels.

Interest in future requirements is light and has shown no upward inclination. Farm implement manufacturers have not increased their orders and jobbers evince no need to increase stocks. Railroad needs for fourth quarter should appear soon. Automotive consumers are taking most volume.

The most important bolt and nut tonnage now in the market is 2000 tons of alloy material for the midtown tunnel of the Port Authority of New York.

Bolts and nuts currently are 73 off list, 2.60c for large rivets and 70, 10 and 5 off for small rivets. Prices on cotter pins are expected to be advanced soon.

Sheets

Mills Rushing Shipments on Expiring Contracts—Chrysler Buys 300,000 Car Wheels

SHEET PRICES, PAGE 36

Pittsburgh—Buyers of sheets continue confused over certain interpretations of the steel code. With questions revolving around trucking rates, switching charges and other commercial angles still unsettled, a dampener on general demand for sheets continues and orders the past week in the market were still restricted. Several mills in this district continue active, mainly on the rolling of automobile sheets. Mills are already quoting the revised gage differentials on hot rolled and galvanized sheets with cold rolled gage differentials unchanged. Present prices are: Black, 2.25c; galvanized, 2.85c; and No. 10 gage hot rolled 1.65c, with 1.75c for fourth quarter. Cold rolled prices at 2.30c and 2.75c for 10 and 20 gage, respectively, will apply next quarter.

Cleveland—Sheet mill operations here, and in an adjacent lake district serving the Michigan automotive territory, are holding up; a Cleveland producer lighting another open-hearth furnace for steel to insure delivery of all sheet and strip specifications by Sept. 30. Sept. 15 was the deadline for specifications on third quarter contracts, and all material was ordered out. Mills cannot extend deliveries on these contracts beyond this month. New business is not coming in satisfactorily, and unless it improves over the remainder of September sheet mill operations will be reduced sharply next month. Few orders have been placed at the advanced prices for fourth quarter.

Chicago—While new sheet business is quiet, shipments and production continue heavy in the closing out of old contracts. Shipments to the automotive industry are declining slowly, and the movement to some interests shows but little change so far this month, compared with the August rate. Fourth quarter contracting is rather slow, with prices continued at prevailing levels except on No. 10 gage hot rolled annealed sheets, which are 1.85c, Gary, base.

Boston—New business is light, higher prices for No. 10 hot rolled driving in little volume. Buyers generally specified well on old orders and in some instances are prodding producers for shipment.

New York—Featuring the market are substantial releases on contracts from consumers who will be confronted with higher prices Oct. 1. Practically all sellers now are quoting 1.75c, Pittsburgh, on No. 10 hot rolled; 2.25c, and 2.85c, on black and galvanized, respectively; and 2.30c and 2.75c, Pittsburgh, for No. 10 and No. 20 cold rolled, respectively. While prices of cold rolled sheets represent no change from those originally filed with the American Iron and Steel institute last month, they are higher than those ruling on current quarter contracts.

Philadelphia—Substantial specifications on contracts still are coming out, particularly for cold rolled sheets. Prices recently announced for fourth quarter now are generally in effect.

The Budd Wheel Mfg. Co., this city, has booked an order for 300,000 pressed steel wheels from the Chrysler Motor Co. for 1934 cars. Additional orders for this type of wheel from two other automobile companies are awaiting production at the Budd plant.

Buffalo—Demand for sheets has regained much of its former activity after a brief period of dullness. District mills are again operating at about 70 per cent, near the peak of the past three years.

Cincinnati—Some buying is noted at the new prices. These orders, with heavy specifying on contracts, are maintaining production at about 60 per cent.

St. Louis—The leading sheet producer in this district has opened books for fourth quarter with slight change in prices. No. 10 hot rolled are advanced $2 per ton to 2.09c per pound. Business is slowing.

Railroads

Test on Code Selling Seen; N.Y.C. To Buy More Rails

Track Material Prices, Page 37

Unusual interest attaches to opening of bids by the Pennsylvania Sept. 28 and 29 on steel requirements aggregating about 12,000 tons. This is one of the first Clayton act openings since the steel code went into operation and it is believed it will bring to the surface several controversial points relative to selling to railroads under code regulations. The Pennsylvania bids to be opened Sept. 28 will

include plates, shapes, bars, wheels, axles, tie plates, joints and pig iron. Those opened Sept. 29 will cover tires, boiler tubes, pipe and sheets. Norfolk & Western will take private bids in September on pipe and nails. Atlantic Coast Line and Seaboard line also are inquiring for miscellaneous needs. New York Central will open bids Sept. 20 for 125 tons of plain foundry pig iron and 50 tons of malleable for its shops at Elkhart, Ind.

Bids were taken Sept. 15 by the Chesapeake & Ohio on about 7000 tons of tie plates; 7880 200-pound kegs of spikes; 3100 200-pound kegs of track bolts and sufficient angle bars to lay its recent order for 31,481 tons of rails. Of this rail tonnage the Steel Corporation has allocated 2644 tons to Carnegie Steel Co., Pittsburgh, the remainder awarded the Corporation to be rolled by Chicago mills.

New York Central has authorized the purchase of 10,000 tons of steel rails but the purchase may be delayed pending a conference on prices sponsored by Joseph B. Eastman, federal transportation co-ordinator.

Billet light rails now are quoted at $32, Pittsburgh, and rerolled light rails at $31, Pittsburgh. These prices are $2 and $1, respectively, lower than the prices originally filed with the institute. The base is 25 to 40 pounds. On 50 to 60-pound rails an extra of $5 is placed. From 16 to 20 pounds the extra is $1 on 12-pound rail the extra is $2 and on 8 and 10-pound it is $5.

Relaying rails are now being quoted on a gross ton basis, f.o.b. Pittsburgh, with current prices $24.50 for 20 to 45-pound sections; $20 for 50 to 75-pound sections; $23.50 for 80 to 100-pound sections. Splice bars now are quoted at a price per piece, depending on size and weight.

Car Orders Pending

Navy, bureau of supplies and accounts, Washington, three, nine or 11 all-steel 50-ton flat cars; six or seven all-steel, 50-ton box cars; six or seven 50-ton flats with floor; four all-steel, 50-ton gondolas; four 30-ton flats with wood floors, narrow gage; two 50-ton steel hoppers; two 70-ton flats, wood floors. Delivery to various navy yards, Canal Zone and Hawaii.

National Association of Petroleum Steel Rig Manufacturers has been organized at Tulsa, Okla., with headquarters at 918 Atlas Life building. C. R. Krause, mid-continent manager of L. C. Moore & Co., Pittsburgh, was elected president, and H. L. Dickinson, formerly, with American Steel Derrick Co., Tulsa, Okla., secretary and office manager.

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Tin Mill Black
Mansfield Electrical Sheets

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New York, Chicago, Dayton, Cleveland, Indianapolis, Detroit, St. Louis, San Francisco

Structural Shapes

Great Lakes Breakwaters To Take Heavy Tonnage of Sheet Piling, with First Bids This Month—2500 Tons Placed for Distillery, 1320 Tons for Lookout Towers

STRUCTURAL SHAPE PRICES, PAGE 36

Cleveland—For two breakwaters in the Chicago district, bids on which are to be taken shortly, approximately 14,000 tons of sheet piling will be required, as detailed on this page under "contracts pending." These are the first of the Great Lakes improvements which will take a large tonnage of steel. Plans for the breakwater at Buffalo, which was to require 15,000 tons, have been dropped, at least so far as steel is concerned, because of soil condition. Breakwaters at Presque Isle, Mich., Port Washington and Kewanee, Wis., Huron and Fairport, O., collectively requiring 12,000 tons of sheet piling, are first on the list for action next year. Plans for additional improvements extending over several years are being shaped up, but the projects have not been authorized. Current demand for shapes here is restricted to small lots.

Pittsburgh—Approximately 1300 tons of structural shapes are required for the new Pittsburgh postoffice ramps, bids on which will close Sept. 20. American Bridge Co. has booked approximately 450 tons for Pittsburgh bridge repairs for the Pittsburgh & West Virginia railway, and the Guibert Steel Co. and Fort Pitt Bridge Works, Pittsburgh, have been awarded a total of 1450 tons for West Virginia bridges. Plain material is 1.60c, Pittsburgh, for fourth quarter.

Chicago—New inquiry totaling approximately 16,000 tons consists principally of nearly 14,000 tons of piling for two federal projects and 3500 tons for state bridges. The largest item is 10,000 tons of piling for a breakwater in Calumet harbor here. Public work is being pushed more rapidly and bids closed this week on 14,000 tons of structural shapes and piling, principally for river and harbor improvements. The largest private award is for the Hiram Walker distillery at Peoria, Ill., which will require 2500 tons eventually. Other awards are small.

Boston—Structural steel demand is light. Bridges are likely to require the bulk of tonnage taken in this territory during the remainder of the year.

New York—In addition to bids on Grand Island bridges at Buffalo, as reported under "shapes pending," an increasing number of bridges are coming out for bids, although 16,000 tons for the Triboro bridge towers in New York may be delayed by the failure to secure land.

Philadelphia—Structural demand is featured by the placing of 650 tons for a mail platform at the Pennsylvania railroad's Thirtieth street development here. Few other requirements are appearing. Fourth quarter shape prices still are to be clarified.

Contracts Placed

2500 tons, distillery, Peoria, Ill., for Hiram Walker & Sons Inc., Detroit, to Mississippi Valley Structural Steel Co., Decatur, Ill.

1320 tons, lookout towers for department of agriculture; 1200 tons to International-Stacey Corp., Columbus, O.; and 320 tons to Aermotor Corp., Chicago.

1100 tons, three state bridges, West Virginia, to Fort Pitt Bridge Works, Pittsburgh.

650 tons, mail platform, Pennsylvania railroad station, Philadelphia, to Shoemaker Bridge Co., Pottstown, Pa.

500 tons, state bridge, Dungeness river, Washington, to Pacific Car & Foundry Co., Seattle; general contract to West Coast Construction Co., Seattle.

475 tons, plant at Trona, Calif., for American Potash & Chemical Co., to Virginia Bridge & Iron Co., Roanoke, Va.

400 tons, boiler room for American Medical Spirits Corp., Louisville, Ky., to Louisville Bridge & Iron Co., Louisville, Ky.

370 tons, bridge, Des Moines county, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

350 tons, bridge, Norfolk, Nebr., to Omaha Steel Works, Omaha.

350 tons, state bridge, West Virginia, to Guibert Steel Co., Pittsburgh; opening of Aug. 30.

350 tons, building, Chrysler Corp., Detroit, to Whitehead & Kales Co., Detroit.

340 tons, bridges, Lee and Des Moines counties, Iowa, to Clinton Bridge Works, Clinton, Iowa.

300 tons, buildings, Merrimac Chemical Co., Everett, Mass., to New England Structural Co., Everett.

300 tons, bridge, Carroll county, Missouri, to St. Joseph Structural Steel Co.; Otto W. Knutson, Kansas City, Mo., general contractor. Sheffield Steel Corp., Kansas City, Mo., awarded concrete bars.

258 tons, state highway bridge, Rochester-Scottsville, Monroe county, New York, to Lackawanna Steel Construction Corp., Buffalo; Robert E. Tompkins, Rochester, N. Y., general contractor.

215 tons, buildings, Maryland Distillery Co., Baltimore, to Dietrich Bros., Baltimore.

200 tons, clinker building, Dewey, Okla., for the Dewey Portland Cement Co., to North American Car Co., Chicago.

200 tons, bridge, Flagstaff, Ariz., to Kansas City Structural Steel Co., Kansas City, Mo.

200 tons, brewery, City Ice & Fuel Co., Miami, Fla., to Ingalls Iron Works Co., Birmingham, Ala.

195 tons, brewery, Heidelberg Brewing Co., Covington, Ky., to Lang Iron Works, Cincinnati.

190 tons, highway bridge, Wilmington, Del., to Virginia Bridge & Iron Co., Roanoke, Va.

150 tons, state bridge, Salado creek, highway 2, Bexar county, Texas, to North Texas Iron & Steel Co., Fort Worth; Purvis & Bertram, Fort Worth, general contractors.

150 tons, state highway bridge, Barnes Corners-West Lowville, N. Y., to Lackawanna Steel Construction Corp., Buffalo; O'Grady & Quillinan, Cohoes, N. Y., general contractor.

150 tons, factory, 3600 Mines avenue, Los Angeles, to unnamed interest.

130 tons, grain elevator, Chicago, to Mississippi Valley Structural Steel Co., Decatur, Ill.

120 tons, pulp storage building, Kalamazoo, Mich., to Kalamazoo Foundry & Machine Co., Kalamazoo.

110 tons, viaduct, Western avenue, Los Angeles, plain material awarded to Columbia Steel Co., San Francisco.

110 tons, bridge, Robertson, Mo., to Stupp Bros. Bridge & Iron Co., St. Louis.

106 tons, state bridge, Samish river, Skagit county, Washington, to Isaacson Iron Works, Seattle; general contract to D. Nygren, Seattle.

104 tons, state highway bridge, Erie county, New York, to McClintic-Marshall Corp., Bethlehem, Pa.; A. K. Van Ingen, Hamburg, N. Y., general contractor. Joseph T. Ryerson & Son Inc., New York, awarded concrete bars.

Shape Awards Compared

	Tons
Week ended Sept. 16	**11,893**
Week ended Sept. 9	**6,659**
Week ended Sept. 2	**8,083**
This week in 1932	**10,409**
Weekly average, 1932	**14,285**
Weekly average, 1933	**13,965**
Weekly average, Aug.	**6,982**
Total to date, 1932	**592,661**
Total to date, 1933	**530,672**

Contracts Pending

15,000 tons, superstructure, midtown postoffice, Eighth avenue, Thirty-first and Thirty-third streets, New York; supplemental bids being taken from original bidders. D. M. W. Contracting Co., low on previous opening Feb. 28.

14,000 tons, approximate, sheet piling; 5000 feet of breakwater at Calumet, Mich., and 2400 feet at Indiana Har-

bor, Ind. Bids to United States engineer, second Chicago district, Chicago; on Calumet project, Sept. 25; on Indiana Harbor, Oct. 15.
12,375 tons, superstructure for Grand Island bridges, Erie and Niagara counties, New York; Taylor-Fichter Steel Construction Co., New York, low.
1300 tons, highway bridges, Oklahoma.
1300 tons, Pittsburgh postoffice ramps; bids Sept. 20.
1200 tons, steel face dam, Middle Rio Grande Conservancy district, New Mexico.
1000 tons, ship for Swayne & Hoyt, San Francisco; Gulf Industries Inc., Pensacola, Fla., low.
1000 tons, including 400 tons of H-columns, pier at Santa Barbara, Calif., for Pacific Western Oil Co.; general contract to Macco Construction Co., Los Angeles.
900 tons, bridge over Merrimac river, Ten Brook, Mo., near St. Louis.
700 tons, piling, dyke, Port Bolivar, Galveston harbor, Tex.; bids Sept. 22 to United States engineers, Galveston.
658 tons, state overhead crossing, Santa Fe tracks, San Bernardino county, California; bids Sept. 27.
375 tons, miscellaneous structures for the Carbide & Carbon Chemical Corp., South Charleston, W. Va.
350 tons, bridge, New London, Wis.
260 tons, highway bridge, Globe, Ariz.
200 tons, highway bridge, Colorado.
100 tons, Schmick Brewing Co., Freeport, Ill.
Unstated, machine and electric shop, Puget Sound, Wash., navy yard; bids to be opened at Bremerton, Wash., Oct. 9.
Unstated, six road bridges in Alaska, for Alaska road commission; bids at Seattle, Sept. 15.

Concrete Bars

New Jersey and Pennsylvania Begin First Road Projects in Many Months Under National Recovery Program —General Market Is Quiet, and Awards Lighter

REINFORCING BAR PRICES, PAGE 36

Pittsburgh—Bids to close Sept. 20 call for 500 tons of bars for the new Pittsburgh postoffice ramps. A Pennsylvania state letting Sept. 29 at Harrisburg, Pa., requires over 91,000 square yards of reinforced concrete pavement. In filing a price of 1.75c, Pittsburgh, and 1.80c, Chicago, Buffalo, Cleveland, Birmingham, Ala., and Youngstown, O., on rail steel bars, producers have also named 2.15c, Gulf ports, and 2.30c, Pacific coast ports, as bases at those points. The price of new billet steel reinforcing bars remains 1.80c, Pittsburgh, and 1.85c, other basing points, with the exception of Pacific coast and Gulf ports.

Cleveland—The Ohio highway department opened bids Sept. 15 on 13 road projects, collectively requiring 154 tons of concrete bars and 60 tons of shapes, this being one of the few openings of this year. Private work also is light. New billet steel in cut lengths of 4 feet or longer in 5-ton lots or more to consumer is 1.95c base, Cleveland, and 2.10c in smaller lots. Rail steel bars in lots of 15 tons or more now are 1.80c, Cleveland, with differentials for smaller amounts.

Chicago—Road building programs are slow to develop into concrete bar orders. About 400 tons have been placed for Wisconsin highways, but bids have yet to be asked for similar work in Illinois and other nearby states. Private building continues quiet. New business at recently advanced prices of 1.95c for cut lengths of billet bars, and 1.80c for rail steel bars is appearing slowly.

Philadelphia—Reinforcing bar sellers are cheered by the first state road work to appear under the national recovery program. New Jersey will open bids over the next three weeks on work requiring 1000 tons. Pennsylvania will make a modest beginning, Sept. 29, with the first road work in seven or eight months. The market is firm.

Boston — Highway and bridge awards are slightly heavier, while general construction requirements are light. Prices are firm at 1.95c, Buffalo, for cut lengths of billet bars, and 1.85c for rail steel bars, with district rerollers in line with the advance.

New York—Mesh buying features the market, New York and New Jersey supplying the bulk of the inquiry for highways. Additional tonnage is out for both states. Demand for billet bars is dull. Prices are firm.

Concrete Awards Compared

	Tons
Week ended Sept. 16	**2,720**
Week ended Sept. 9	**5,682**
Week ended Sept. 2	**6,735**
This week, 1932	**1,581**
Weekly average, 1932	**3,920**
Weekly average, 1933	**3,474**
Weekly average, Aug.	**3,074**
Total to date, 1932	**155,638**
Total to date, 1933	**132,006**

Contracts Placed

459 tons, rail steel bars and mesh, highway, Calhoun county, Texas, to Austin Bros. Dallas Tex.; Austin Bridge Co., Dallas, general contractor.
370 tons, Wisconsin road work; 270 tons to Concrete Steel Co., 100 tons to Concrete Engineering Co., Chicago.
350 tons, dam work near Barre, Vt., to Carroll & McCreary Co. Inc.; through United States engineer, New York.
250 tons, bridges, Elm, Montague and Bozier creeks, highway No. 5, Cooke county, Texas, to Concrete Engineering Co.
250 tons, mesh, highway Ogdensburg-Morristown, New York, to Kalman Steel Corp., Bethlehem, Pa.; through John Thompson, Carthage, N. Y.
200 tons, Hiram Walker & Sons Inc. distillery, Peoria, Ill., to Kalman Steel Corp., Bethlehem, Pa.
200 tons, Washington state highway projects, to Northwest Steel Rolling Mills, Seattle.
200 tons, addition to state hospital Medical Lake, Wash., to Builders Supply Co., Spokane.
200 tons, mesh, highways, New York, to Kalman Steel Corp., Bethlehem, Pa.; through Joseph M. Murray, Rochester, N. Y.
190 tons bridge substructure, Hoosic river, Williamstown, Mass., to Truscon Steel Co., Boston; J. F. Fitzgerald Co., Boston, general contractor.
180 tons, mesh, highway, Putnam county, New York, to Kalman Steel Corp., Bethlehem, Pa.
160 tons, Montgomery Ward & Co. building, Redwood City, Calif., to Soule Steel Co., San Francisco.
111 tons, highway, Hemphill county, Texas, to Texas Steel Co., Fort Worth, Tex.
100 tons, James Madison Memorial bridge, Rappahannock river, Port Royal, Va., to Virginia Steel Co., Richmond, Va.; J. S. Bowers, Whiteville, N. C., general contractor.
100 tons, ward and commissary buildings, state hospital, Steilacoom, Wash., to Northwest Steel Rolling Mills, Seattle.

Contracts Pending

1600 tons, substructure, Grand Island bridges, Erie and Niagara counties, New York; Booth & Flinn, Buffalo, low for general contract.
500 tons, postoffice ramps, Pittsburgh; bids Sept. 20.
325 tons, for Panama; bids Sept. 21.
200 tons, state bridge, San Bernardino county, California; bids Sept. 27.
195 tons, highway route 29, section 12A, Centerville to River Road, Somerset county, New Jersey; bids Sept. 25.
160 tons, two state bridges in Oregon; bids at Portland, Oreg., Sept. 29.
125 tons, highway, route 29, section 11, Hunterdon county, New Jersey; bids Oct. 2.
125 tons, Chartiers creek bridge, Carnegie, Pa. General contract of F. W. Scott Co., Pittsburgh, at $67,845 revoked. Revised bids to be asked.
119 tons, state bridges in Apache and Navajo counties, Arizona; bids Sept. 26.
110 tons, rail steel, state highway, Brookline-Newton, Mass.; Coleman Bros., Boston, general contractors.

Pipe

Large Tonnages Pend in Middle Western States—New Discounts on Seamless Boiler Tubes

PIPE PRICES, PAGE 37

Pittsburgh—Both Jones & Laughlin Steel Corp. and Spang, Chalfant & Co. Inc. were rolling on an order for 10-inch line pipe last week, which was divided for the New York State Natural Gas Co. Each received 100,000 feet, or 1700 tons. Otherwise, pipe mill activity here is conspicuously lacking. Pipe producers, having adopted the list of July 1 covering line and standard pipe, have now adopted discounts on seamless boiler tubes under which latter schedules both hot-finished and cold-drawn boiler tubes are quoted in four quantity differential brackets: Up to 10,000 pounds; 10,000 to 24,999 pounds; 25,000 pounds to carload; and carload lots and over. In each classification but the latter, jobbers and consumers take different discounts. On carloads and over, jobbers and consumers are quoted similarly.

Chicago—A few federal loans have been approved for water systems, and action on other applications is expected to be more rapid over coming weeks. More than 90 Illinois towns are seeking funds for waterworks which, conservatively, would require more than 15,000 tons of cast pipe. Pipe needs in other states also are believed to be large.

Boston—Several large cast pipe projects pend, with applications in for loans. One requires 1000 tons of 6 to 12-inch. Standard cast pipe is firm at $35, local foundry. Steel pipe buying is light.

New York—Cast pipe inquiry is light, with buying limited to a few hundred tons for miscellaneous needs, including several highway projects. Bids go in Sept. 20 on approximately a 500-ton requirement for New York.

Birmingham, Ala.—Awards are not frequent, and tonnage is light. Some shops are operating three days a week.

Cast Pipe Pending

100 tons, 12-inch and under, state hospital, Rome, N. Y.

800 Rooms 800 Baths

Steel Men like Hotel
DETROIT-LELAND

The large comfortably furnished rooms - - the beautiful lounges - - the delicious food - - the friendly atmosphere - - and the moderate rates, all add to the pleasure of your visit here.

Single $2.50 up Garage Double $3.50 up

DETROIT'S NEWEST DOWNTOWN HOTEL
Cass at Bagley Avenue

Strip

New Prices Being Applied; Shipments on Contract Heavy

Strip Prices, Page 37

Pittsburgh—Application of 2.40c, base, Pittsburgh, on cold-rolled strip and 1.75c, Pittsburgh, on hot-rolled strip is expected to be made on certain orders beginning this week. On existing contracts, not fully specified, strip mills will enter orders until the end of September. The new price of cold-rolled strip will, by the fourth quarter, have established a $13 per ton differential over hot-rolled strip, against a $12 differential at present, and as low as $6 to $7 a ton spread before the steel code was adopted. Owing to the prospective advance in hot-rolled strip, cooperage hoop for fourth quarter will also be up $2 a ton to 1.85c, Pittsburgh.

Cleveland—Little, if any, tonnage has been sold at the advanced prices of 2.40c, base, Cleveland, for cold-rolled strip, and 1.75c, base, Pittsburgh, for hot-rolled. Shipments will be made until Sept. 30 on recent orders at 2.25c, and 1.65c, respectively, as well as on lower priced third quarter contracts. Material on these contracts had to be specified by Sept. 15, and there are no instances of buyers having canceled any amount. For the present, therefore, mills are coasting along on these specifications.

Chicago—Strip users are interested in shipments against contracts in view of higher prices for fourth quarter, particularly on cold-rolled strip. The 2.40c, Pittsburgh-Cleveland, base on the latter compares with 1.80c and less on third quarter contracts. Hot strip will be $2 a ton higher at 1.85c, Chicago. Shipments consequently are heavy, while new business continues rather light.

Boston—Cold-rolled strip mills have opened books for fourth quarter at 2.60c, Worcester. Considerable business was taken at 2.45c, Worcester, before the advance, with the stipulation that shipments be made as soon after Sept. 16 as possible. Operations hold around 60-65 per cent and shipments against contracts are heavy.

New York—Continued substantial releases against current contracts for

steel strip, apparently in expectation of higher prices on such new tonnages as may be placed, characterize the market. Hot rolled strip for delivery after Sept. 30 will be 1.75c. Pittsburgh, an increase of $2 a ton over the current market, and cold strip 2.40c, Pittsburgh, an advance of $3. The carlot freight rate from Pittsburgh is 35 cents per 100 pounds. Forward buying to date is negligible.

Philadelphia — Specifications against contracts are heavy but new business in steel strip is negligible. Fourth quarter quotations generally are 1.75c, Pittsburgh, for hot-rolled and 2.40c, Pittsburgh, for cold-rolled.

Wire

New Procedure Delays Sales; Prices Given No Test

Wire Prices, Page 36

Pittsburgh—Present prices on wire products have been extended into fourth quarter. at $2.10 per keg for nails and 2.10c on plain manufacturing wire. Revisions have been made in extras for mixed and joint cars of wire products but the straight less-carload rate on nails is still $2.40 per keg. In coiled wire, revisions have been made in less carload lots for items of 1000 pounds or more. A revised card on processing extras, finds extra changes in 15 through 20 gage, inclusive. New orders for wire products are generally less frequent but production of nails and wire in this district is, in some instances, over 70 per cent of capacity.

Cleveland—The market is quieter and interest centers on specifications which under the code must be shipped by Sept. 30. Currently the market for plain wire is 2.10c, base, Cleveland, and $2.10 for nails, but leading wire sellers have not yet determined prices for fourth quarter. Little inquiry is pending on which to quote.

Chicago—Difficulties in interpretation of some provisions of the steel code, particularly those relating to freight charges and modes of transportation, delay buying of wire products. Shipments against contracts are fairly heavy, but fourth quarter business is rather slow. The market is unchanged on new business at $2.15 for wire nails and 2.15c for plain wire.

Boston — Wire mill operations continue high and, although pressure for deliveries has eased, shipments are heavy on third quarter contracts. Prices are firm, with plain wire 2.20c, Worcester. Little fourth quarter business has been done.

Wire Rod Price Extended For Fourth Quarter at $35

Semifinished Prices, Page 38

Wire rod prices have been extended for fourth quarter at $35, Pittsburgh. Sheet bars, billets and slabs currently are $26. Forging billets remain $31; alloy billets $49; and skelp, $32. Demand for sheet bars is fairly active; otherwise the market is quiet.

American Hardware Manufacturers association will hold its annual convention at the Palmer House, Chicago, Oct. 16-19, according to George A. Fernley, secretary-treasurer, 505 Arch street, Philadelphia.

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Pig Iron

Sales Tapering—Labor Agitation Blamed in Some Districts —6800 Tons of Basic Sold

PIG IRON PRICES, PAGE 38

Pittsburgh—Merchant iron interests find the market almost devoid of forward buying. Inconsequential tonnages have been booked at the new prices. The present schedule which is being quoted is $18, Neville Island, on foundry grades, $17.50 for basic, and $18.50 for bessemer. Gray forge is $17.75, Neville Island. Several foundries have before them an inquiry for about 300 tons of castings for the Grand Island bridges at Buffalo.

Cleveland—Shipments from merchant stacks so far this month are approximately 15 per cent ahead of the comparable period in August. Sales, however, are slower. Labor agitation in certain districts is creating a feeling of uncertainty. Sales for the week here totaled about 3000 tons, of which 2000 tons was placed for fourth quarter. Books for that period have been opened at $17.50, base, Cleveland, unchanged from the recent level.

Chicago—Fourth quarter pig iron bookings are being received. Tonnage in such commitments is expected to be smaller than in the past when it was not compulsory that shipments be taken prior to the expiration of the quarter. Some iron remains to be moved on old contracts which extend to Dec. 31. Shipments here so far this month show a slight decline from the August rate. The $17.50 furnace price prevails on new orders for No. 2 foundry and malleable.

Boston — Little fourth quarter business in pig iron has developed as most melters covered on more than third quarter needs. Several of the largest consumers are working with foreign iron. Prices are firm.

Buffalo—Sales are steady, with purchases of 100 to 1000 tons being made by many consumers to cover fourth quarter needs. The melt is being retarded by the labor situation. New prices and differentials are being maintained firmly.

New York—Little interest is manifested by consumers, except to secure tonnages pending on contracts made prior to the recent price advance. No. 2 foundry iron, delivered Brooklyn, is $19.77; and delivered Newark, N. J., $18.89 for most plants, plus freight surcharges. Southern iron is offered at 38 cents under the above market.

The New York Central railroad will open bids Sept. 20 on 125 tons of plain foundry iron and 50 tons of malleable for Elkhart, Ind.

Bids are being taken to Sept. 26 on 52,000 tons of cast iron segments for lining the midtown Hudson river tunnel which will extend from Manhattan to Weehawken, N. J.

Philadelphia—An order for 6800 tons of basic for an eastern Pennsylvania consumer is outstanding in an otherwise quiet market. Prices are unchanged.

Cincinnati—The market is quiet and shipments tend to decline. New inquiries are lacking.

St. Louis—Buying is limited to small lots for prompt shipment, but such orders have become more numerous and represent a considerable tonnage. Demand comes principally from smaller melters who were unable to finance large purchases during the period of low prices.

Birmingham, Ala.—Further easing of buying is noted and two blast furnaces probably will be blown out or banked during the next few days. Shipment of 3000 tons of iron to the East and Middle West has attracted some attention.

Toronto, Ont.—Sales for the week totaled 500 tons. Producers report few contracts, but state spot sales are being made at regular intervals. Pig iron production is at the peak level for the year, with a monthly output close to 40,000 tons.

Coke

Prices Stronger But Coal Strike Has Little Effect

Coke Prices, Page 38

Strike conditions in western Pennsylvania coal fields have brought a stronger feeling in coke prices but expectation of early settlement has prevented a sharp rise in price. Furnace coke holds at about $2.50, Connellsville ovens, but asking prices on foundry coke are up 25 cents to a minimum of $3.25, Connellsville ovens. Premium foundry coke is in small demand and the market is nominal at $4.50, ovens.

By-product foundry coke has been advanced 50 cents to $8.71 to $9.31, Newark, N. J., $10.50 New England and $9, Philadelphia. Prices at other centers have not been changed but recent advances have been established.

At Chicago, foundry coke shipments are moderately lower but domestic heating grades are moving in better tonnage than a year ago. Present prices at that center are quoted for September only.

Iron Ore Receipts and Shipments Increased

Iron Ore Prices, Page 37

Cleveland—Receipts of Lake Superior iron ore at Lake Erie ports for August totaled 3,929,829 tons, compared with 619,342 tons in the month last year, according to the Lake Superior Iron Ore association. Shipments from these ports were 2,812,093 tons, in contrast with 516,315 tons in August last year. Receipts and shipments for the season to Sept. 1, and dock balances follow:

Port	Receipts	Shipments	Dock balance Sept. 1
Buffalo	628,925	458	2,819
Erie	363,221	375,580	121,541
Conneaut	1,343,931	1,274,329	1,752,179
Ashtabula	953,817	1,048,140	1,442,754
Fairport	458,822	477,238	387,735
Cleveland	2,273,776	1,656,733	820,215
Lorain	1,179,061	837,115	13,037
Huron	230,063	214,717	338,503
Toledo	324,419	187,760	16,741
Total	7,756,035	6,072,070	4,895,524
Comparative 1 year ago	1,245,280	1,479,770	5,267,689

Some ore producers report increasing specifications for shipments this year. No difficulties are anticipated over the recent threat of Great Lakes seamen to strike to force action on a code. After several meetings they decided to wait a month or more. Their wages were increased 10 per cent a month ago.

Ferroalloys Price Announcement Awaited

Ferroalloy Prices, Page 38

Announcement of fourth quarter prices for ferroalloys is expected shortly. Meanwhile, sellers are quoting $82, eastern seaboard, on shipments to the end of this month. Specifications are tapering off. Domestic spiegeleisen, 19 to 21 per cent, is unchanged at $27, furnace, the price put into effect early this quarter and which probably will con-

tinue for the present, according to indications.

Unfilled Tonnage Off 129,681 Tons in August

Unfilled orders of the United States Steel Corp. as of Aug. 31 were 1,890,444 tons, a decline of 129,681 tons from the total of July 31, a shrinkage of 6.4 per cent. This was the second consecutive drop in tonnage after three months of upturn. The loss is the heaviest since June, 1932. Unfilled tonnage at the end of August, 1932, showed an upturn of 3293 tons, the first increase in 16 months.

Although steel production declined in August from 58.95 per cent of capacity to 49.42 per cent, bookings fell off more rapidly than operations, giving the reduction in backlog. The reversal is attributed to reduced buying in the face of uncertainties consequent on determination of the provisions of the steel code and the belief prices will not be materially increased for the remainder of the year. Consumers are not buying beyond immediate needs as a result of this situation.

Sheet, Tin Plate and Bar Iron Mill Wages Advanced

Wage increases amounting to approximately 15 per cent, due to NRA agreements, will be in effect in September and October for employes in sheet and tin plate and bar mills having contracts with the Amalgamated Association of Iron, Steel and Tin Workers.

Wages for bar iron workers will be based on a 1.80c card, instead of 1.50c as prevailed in the past two months. This does not represent an increase in the price of bar iron, but an arbitrary assumption. In effect, the customary system has been waived for the 90-day trial period of the steel code. Puddlers' wages will be raised from $9.30 to $10.80 per ton.

A similar situation is noted in the bi-monthly sheet and tin plate mill settlement. The actual average sales price of Nos. 26, 27 and 28 gage black sheets in the past two months was reported as 2.20c, but wages will be paid on a 2.55c card.

Form Pittsburgh Chapter

A Pittsburgh chapter of the American Steel Warehouse association has been formed by steel warehouse interests in that district.

J. C. Goff, Scully Steel Products Co., has been named president and W. L. Abbott, McKee-Oliver & Co. Inc., permanent secretary and treasurer.

J. M. Hilbish, Jones & Laughlin Steel Corp., has been elected chairman of the hot-rolled structural shape and plate division, and D. P. Mulford, J. B. Booth & Co., Pittsburgh, chairman of the hot-rolled bar, band and wire division.

These two committee chairmen become vice presidents of the local chapter. Others not yet selected are chairmen for the following groups: (1) Cold finished bars, cold rolled strip and cold rolled wire; (2) Sheet steel, both primes and seconds; (3) Mechanical and boiler tubes. These unannounced chairmen also will become vice presidents.

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Scrap

Buying Deferred but Prices Hold Well—Some Melters Slow To Take Shipments

Pittsburgh—A buying test in scrap developed last week following two dull weeks, when a district mill purchased tonnages of heavy melting steel, at $12.50 and $13. By the establishment of this sale the market has become quotable at $12.50 to $13 or off 50 cents from the former level, which had come to be regarded as purely nominal. Although the 3500-ton item on the Pennsylvania railroad's 10,000-ton August list did not come into the immediate Pittsburgh district, nevertheless the price paid of $12.50, nearby mill, has had some bearing upon local sentiment. The same is true of the B. & O. list which at the same price went to a down-river mill. Pittsburgh & Lake Erie railroad withdrew 20 carloads of scrap from competitive bidding re-

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.50 to 10.50
Boston, dealers	7.25 to 7.50
Buffalo, No. 1	11.00 to 11.50
Buffalo, No. 2	10.00 to 10.50
Chicago	9.50 to 10.00
Cleve., No. 1	10.50 to 11.00
Cleve., No. 2	10.00 to 10.50
Det., No. 1	8.75 to 9.25
Det., No. 2	7.75 to 8.25
E. Pa.	10.50 to 11.50
E. Pa., No. 2	9.50 to 10.50
Federal, Ill.	8.75 to 9.25
Granite City, Ill.	8.25 to 8.75
N. Y., deal. R. R.	7.00 to 8.00
N. Y., deal. No. 2	6.00 to 7.00
N. Y. deal. yd.	5.50 to 6.00
Pitts., No. 1	12.50 to 13.00
St. L. No. 1 del.	9.75 to 10.25
Valleys, No. 1	13.00 to 13.50

COMPRESSED SHEETS

Buffalo, dealers	9.50 to 10.50
Chi. (Factory)	8.00 to 8.50
Cleveland	10.00 to 10.50
Detroit	8.75 to 9.25
E. Pa. new mat.	10.50 to 11.00
Pittsburgh	12.50 to 13.00
Valleys	12.50 to 13.00

BUNDLED SHEETS

Buffalo	5.50 to 6.00
Cincinnati, del.	6.00 to 6.50
Cleveland	8.00 to 8.50
Eastern Pa.	9.00 to 10.00
Pittsburgh	11.75 to 12.25
St. Louis	6.00 to 6.50

SHEET CLIPPINGS LOOSE

Chicago	4.50 to 5.00
Cincinnati	5.00 to 5.50
Detroit	6.00 to 6.50
St. Louis	5.50 to 6.00

STEEL RAILS SHORT

Birmingham	11.50 to 12.00
Boston, dealers	7.00 to 7.25
Buffalo	12.00 to 12.50
Chicago (3 ft.)	11.00 to 11.50
Chicago (2 ft.)	12.00 to 12.50
Cincinnati, del.	12.00 to 12.50
Detroit	11.00 to 11.50
Pitts. (open-hearth, 3 ft. and less)	15.00 to 15.50
St. Louis	11.50 to 12.00

STOVE PLATE

Birmingham	7.00 to 8.00
Boston, dealers	4.50 to 4.75
Buffalo	9.00 to 9.50
Chicago, net	7.00 to 7.50
Cinci., deal.	7.00 to 7.50
Detroit, net	4.50 to 5.00
Eastern Pa.	9.50
N. Y. deal. Fdry.	6.00
St. Louis	7.00 to 7.50

COUPLERS, SPRINGS

Buffalo	11.50 to 12.00
Chicago	10.50 to 11.00
Eastern Pa.	14.00 to 15.00
Pittsburgh	14.75 to 15.25
St. Louis	10.00 to 10.50

ANGLE BARS—STEEL

Chicago	10.50 to 11.00
St. Louis	10.00 to 10.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	11.50 to 12.50
Cleveland bil. and bloom crops	12.50 to 13.50
Eastern Pa.	14.00 to 15.00
Pittsburgh billet bloom crops	15.00 to 15.50
Pitts., sheet bar crops	15.00 to 15.50

FROGS, SWITCHES

Chicago	9.50 to 10.00
St. Louis	10.00 to 10.50

SHOVELING STEEL

Chicago	9.50 to 10.00
Cleveland	10.50 to 11.00
St. Louis	9.00 to 9.50

RAILROAD WROUGHT

Birmingham	8.00 to 8.25
Boston, dealers	2.00 to 2.50
Buffalo, No. 1	7.00 to 8.00
Buffalo, No. 2	11.00 to 11.50
Chi., No. 1, net	8.00 to 8.50
Chi., No. 2	9.50 to 10.00
Cinci., No. 2	9.50 to 10.00
Eastern Pa.	11.00 to 12.00
N. Y., No. 1 deal.	8.00 to 8.50
Pitts., No. 1	12.75 to 13.25
St. Louis, No. 1	7.00 to 7.50
St. Louis, No. 2	8.75 to 9.25

SPECIFICATION PIPE

Boston	4.00 to 4.50
Eastern Pa.	9.50 to 10.00
N. Y., deal.	5.50 to 6.00

BUSHELING

Buffalo, No. 1	9.50 to 10.50
Chicago, No. 1	7.75 to 8.25
Cinci., No. 1 deal.	7.00 to 7.50
Cinci., No. 2	3.50 to 4.00
Cleve., No. 2	8.00 to 8.25
Det., No. 1 new	7.50 to 8.00
St. Louis, No. 1	6.50 to 7.00
Val. new No. 1	12.50 to 13.00

MACHINE TURNINGS

Birmingham	4.00 to 5.00
Boston, dealers	3.00 to 3.50
Buffalo	6.75 to 7.25
Chicago	5.50 to 6.00
Cinci., deal.	5.50 to 6.00
Cleveland	7.75 to 8.00
Detroit	6.00 to 6.50
Eastern Pa.	7.50 to 8.50
N. Y., deal.	4.00 to 4.50
Pittsburgh	9.50 to 10.00
St. Louis	4.50 to 5.00
Valleys	10.75 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, dealers	2.50 to 2.75
Buffalo	6.75 to 7.25
Cinci., deal.	5.50 to 6.00
Cleveland	7.75 to 8.25
Detroit	6.75 to 7.25
Eastern Pa.	7.00 to 7.50
N. Y., deal	4.00 to 4.50
Pittsburgh	9.25 to 9.75

CAST IRON BORINGS

Birming., plain	3.50 to 4.50
Boston, chem.	10.00 to 11.00
Boston, dealers	3.25 to 3.50
Buffalo	6.75 to 7.25
Chicago	5.50 to 6.00
Cinci., deal.	5.50 to 6.00
Cleveland	7.75 to 8.25
Detroit	6.75 to 7.25
E. Pa., chem.	12.00 to 15.00
N. Y., deal	4.00 to 4.50
Pittsburgh	9.25 to 9.75
St. Louis	4.75 to 5.25

PIPE AND FLUES

Cinci., deal.	4.50 to 5.00

RAILROAD GRATE BARS

Buffalo	5.00 to 5.50
Chicago, net	7.00 to 7.50
Cincinnati	5.00 to 5.50
Eastern Pa.	9.00 to 9.50
N. Y., deal.	5.25 to 5.50
St. Louis	6.00 to 6.50

FORGE FLASHINGS

Boston, dealers	5.00 to 5.50
Buffalo	9.00 to 9.50
Cleve. ov. 10 in.	9.00 to 9.50
Detroit	7.50 to 8.00

FORGE SCRAP

Boston, dealers	4.00 to 4.50
Chicago (heavy)	11.00 to 11.50
Eastern Pa.	10.50

ARCH BARS, TRANSOMS

Chicago, net	8.00 to 8.50
St. Louis	9.50 to 10.00

AXLE TURNINGS

Boston, dealers	4.50 to 4.75
Buffalo	7.50 to 8.00
Chi., elec. fce.	8.00 to 8.50
Cleveland	9.50 to 10.00
Eastern Pa.	10.00 to 10.50
St. Louis	5.50 to 6.00

STEEL CAR AXLES

Birmingham	11.00 to 11.50
Boston, ship. pt.	8.00 to 8.50
Buffalo	10.00 to 11.00
Chicago, net	10.00 to 10.50
Eastern Pa.	15.50
St. Louis	11.50 to 12.00

SHAFTING

Boston, ship. pt.	9.25 to 9.75
Eastern Pa.	15.00 to 15.50
N. Y., deal.	10.00 to 10.25
St. Louis	8.00 to 8.50

CAR WHEELS

Birming., iron	9.00 to 9.50
Boston, iron deal.	6.75 to 7.25
Buffalo, iron	8.00 to 9.00
Buffalo, steel	11.00 to 11.50
Chicago, iron	9.50 to 10.00
Chi., rolled steel	10.50 to 11.00
Cincinnati, iron	9.00 to 9.50
E. Pa., iron	12.00 to 13.00
E. Pa., steel	14.00 to 15.00
Pitts., iron	12.25 to 12.75
Pitts., steel	14.50 to 15.00
St. Louis, iron	8.50 to 9.00
St. Louis, steel	10.00 to 10.50

NO. 1 CAST SCRAP

Birmingham	9.00 to 10.00
Boston, No. 2	5.00 to 5.50
Boston, Tex. con.	10.75 to 11.00
Buffalo, cupola	10.00 to 10.50
Buffalo (mach.)	11.00 to 11.50
Cleve. cupola	10.50 to 11.00
Chi., mach. net	9.50 to 10.00
Chi., railroad net	9.00 to 9.50
Cinci., mach. cup.	9.00 to 9.50
Cleve. cupola	10.00 to 10.50
Detroit, net	8.00 to 8.50
E. Pa., cupola	12.00 to 13.00
N. Y., cup. deal.	6.00 to 6.50
N. Y., del. local foundries	9.00 to 9.50
Pitts., cupola	10.25 to 10.75
San Fran., del.	13.50 to 14.00
Seattle	4.50 to 6.50
St. Louis, No. 1	9.00 to 9.50
St. L. No. 1 mach.	9.00 to 9.50

HEAVY CAST

Boston, del.	5.75 to 6.00
Buffalo, break	7.00 to 8.00
Cleve., break	7.50 to 8.00
Detroit break	6.00 to 6.50
Detroit, auto net	9.00 to 9.50
Eastern Pa.	11.00
N. Y., No. 1, deal.	7.00 to 7.50
N. Y., break. deal.	6.75 to 7.00
Pittsburgh	10.50 to 11.00

MALLEABLE

Boston, consum.	12.50 to 13.00
Buffalo	11.50 to 12.00
Chicago, R. R.	10.50 to 11.00
Cinci., agri. del.	8.50 to 9.00
Cinci., R. R. del.	9.25 to 9.75
Cleveland, rail	11.50 to 12.00
Detroit, auto	8.50 to 9.00
St. Louis, R. R.	9.50 to 10.00
Eastern Pa., R. R.	13.00 to 14.00

RAILS FOR ROLLING
5 feet and over

Birmingham	10.00 to 11.00
Boston, dealers	6.75 to 7.25
Buffalo	9.00 to 9.50
Chicago	11.00 to 11.50
Eastern Pa.	13.00
New York, dealer	8.00 to 8.25
St. Louis	10.50 to 11.00

LOCOMOTIVE TIRES

Chicago, cut	10.50 to 11.00
St. L., No. 1	8.50 to 9.00

LOW PHOS. PUNCHINGS

Buffalo	11.00 to 11.50
Chicago	11.00 to 11.50
Eastern Pa.	13.00 to 14.00
Pittsburgh	15.00 to 15.50

cently. Cast scrap continues active, but several mills still are asking suspension of shipments on other grades of scrap. Although without test, low phos scrap appears obtainable at around $15.

Cleveland—Softening in quotations on borings, turnings and No. 2 busheling is noted. Other grades retain firmness. Buying is at a low mark but small mill stocks indicate need for replenishment before long.

Chicago—The scrap market continues at a standstill. Offerings are increasing, recent railroad lists being heavier than a month ago. Prices realized on such material also show decreases from August figures. Quotations still are nominal, due to absence of buying, with heavy melting steel unchanged at $9.50 to $10. Prices on other grades hold around recent levels.

Boston—Prices on some grades of scrap are nominal, with buying at a standstill. Worcester has dropped delivered price on heavy melting steel to $9 and $8, respectively. Some water shipments have been made to eastern Pennsylvania against contracts. Borings and turnings are again lower.

New York—Buying for export, shipment, chiefly No. 2 heavy melting steel, accounts for most activity in the scrap market. No. 1 and No. 2 steel are lower, a top of $8 being paid by dealers for the former grade and $7 for No. 2. The 50-cent higher price formerly paid for No. 2 in northern New Jersey has been eliminated.

Philadelphia—Further buying of heavy breakable scrap is noted among a few scattered orders. This grade is now firm at $11, delivered.

Buffalo—Consumers are well supplied with scrap for 30 to 45 days and are not in the market. Some prices are nominally about 25 cents lower, without confirming sales. Foundry melt of scrap has been reduced in some instances, but steelworks and other larger consumers have expanded schedules.

Detroit—The iron and steel scrap market continues weak, though no further reductions have been made in prices. There is no buying demand, except willingness of some consumers to take distress material. Some of this loathness to buy is due to uncertainties caused by codes. More scrap appears to be coming out and producers are making quick shipments. There is a feeling that a stronger market will develop later in the fall and that the turn is not far off.

Cincinnati—The market on iron and steel scrap is nominal in the absence of buying, except scattered carloads. Pressure on prices is being resisted by holders, preventing some sales at a lower scale.

St. Louis—The market for iron and steel scrap shows no changes. Dealers have not revised quotations, but most prices are untested and the undertone is noticeably easier than at the close of August and the first week this month. Deliveries have slowed, and the only sale of any importance was 2000 to 3000 tons of No. 1 heavy melting railroad steel to a west side melter, the price reported being $9.75 per ton.

Birmingham, Ala.—Steel and iron scrap shows little activity and prices are weaker. Buying is for immediate needs only.

Toronto, Ont.—Trading in iron and steel scrap is dull. Demand is mostly for specialties. While shipments of steel scrap are being made against export orders, this business is slowing down and will cease at the end of St. Lawrence navigation.

For Boulder Dam Tunnel Construction

This Adit Car—pipe transfer car—engineered and built by Wellman, has solved the problem of transferring lining pipe sections (30′-0″ diameter, 2¾″ thick, up to 24′-0″ lengths, weighing 150 tons) from loading platform outside of construction adits into main tunnels. The pipe is loaded onto transfer car carried on a section of track provided on adit car and arranged for alignment with tracks on tunnel floor. When transfer car reaches its proper position the truck carrying the pipe section moves onto its main track. What are *your* problems?

Wellman Products Include:

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Equipment

Inland Buys Motors, Control Units—Market Is Slow

Chicago — Machinery and equipment sales showed a rather marked decrease the past week and September sales volume to date is well below that for the corresponding August period which in several instances was the highest so far this year. Railroads are placing larger orders for repair parts but are doing little in new equipment purchases, particularly machine tools. Pending work is relatively light, most of recent purchases having been made shortly after issuance of inquiries. Machinery inquiries from steel companies are light.

Pittsburgh — Inland Steel Co., Chicago, has placed an order with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for control equipment and motors for the Inland company's cold-rolled strip mill at Indiana Harbor works, Ind. The order includes a 1000-horsepower main roll motor, a 750-kilowatt motor-generator set, several small auxiliary motors and complete control apparatus. Order will be produced at the Westinghouse company's East Pittsburgh, Pa., works. Buying of other heavy steel equipment is still of negligible proportions and repair work on existing units dominates present activity in that direction.

Boston—Textile mill equipment builders continue active, but shops producing metalworking tools are doing little new business. Activity has not dropped to the early-spring level, but has not yet reflected substantial improvement. Some producers of wire mill machinery have booked moderate business of late. Hendy Machine Co., Torrington, Conn., has booked two engine lathes for the navy for delivery on the Pacific coast. Warren Steam Pump Co. took a navy order at $13,220.

New York—Machine tool buying and inquiry has failed to show much improvement thus far this month. Orders are scattered and generally for one machine at a time. Considerable business has been figured, including equipment for steel mills, but releases for purchasing are slow. Bids are in on two milling machines and a spur gear tooth grinder for the navy shops, Newport, R. I.

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Men of Industry

(*Concluded from Page* 19)

been transferred from the staff of the research laboratory to the general engineering department. Mr. Thearle was graduated from Cornell university in 1921 with the degree of mechanical engineer.

□ □ □

C. C. Abbott has been appointed district sales manager for the Eastern Rolling Mill Co., Baltimore, with offices at 1600 Arch street, Philadelphia.

□ □ □

H. A. Lomax, formerly with Pittsburgh Steel Foundry Corp., Glassport, Pa., is now associated with the Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

□ □ □

H. A. Berg, vice president and general manager, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., will join the Woodward Iron Co., Birmingham, as general manager of operations.

□ □ □

Mrs. B. L. Sommer, widow of B. L. Sommer, late president of the Keystone Steel & Wire Co., Peoria, Ill., was elected a director of the company Aug. 31, to fill the vacancy caused by the resignation of C. W. LaPorte.

□ □ □

Eddie Phillips has joined the Tyson Roller Bearing Corp., Massillon, O., as field sales engineer in charge of mine car antifriction bearing applications. His territory is the southern West Virginia field. Mr. Phillips held a similar position with the Timken Roller Bearing Co. for about 16 years.

□ □ □

Maj. A. E. Carpenter, vice president and general manager of E. F. Houghton & Co., Philadelphia, sailed September 13 to spend several weeks in England inspecting the new, modern plant of E. F. Houghton & Co. of England Ltd., in Manchester, and conferring with the British representatives, Edgar Vaughn & Co. Ltd., in Birmingham.

A strike of 175 employes of the Metal Desk Co., Jamestown, N. Y., has been ended, the men having returned to work on an agreement satisfactory.

Warehouse

Price Changes Await Code; Sales Volume Fairly Steady

Pittsburgh—A leading steel warehouse here has advanced its price on 10-gage hot-rolled sheets 10 cents per 100 pounds, or $2 a ton, although other jobbers of this grade of sheets have not followed. The jobber making the advance now quotes 2.60c on intown Pittsburgh delivery of over 25 bundles and 2.85c for under 25 bundles. Prices of other warehouse products are unchanged, but an advance is expected under the warehouse code.

Cleveland—A revision of warehouse prices is not expected until the warehouse code is adopted. Final hearing on the code is scheduled within the next two weeks. Elimination of freight surcharges Sept. 30 and readjustment of some freight rates also are awaited by some interests before prices are revised. The number of miscellaneous orders has increased slightly, with little change in volume.

Chicago—Warehouse sales show minor fluctuations without developing a definite trend, business so far in September being little changed from that of August. Seasonal improvement is looked for in October.

Boston—Warehouse sales have come back to the August rate after a lull. Base prices on sheets are not changed but adjustments on gages and differentials are being made.

Philadelphia—Warehouse demand has sagged further. Jobbers are applying gage extras on sheets, similar to those recently adopted by mills.

New York—Early price adjustment on several steel products out of warehouse, in line with changes made by mills is expected, although no action has yet developed. Volume has failed to come back fully following the decline earlier in the month.

Detroit—A slight expansion in warehouse requirements is evident as automobile manufacturers place die work for 1934 models. General manufacturing requirements are somewhat lighter. Prices are unchanged, although adjustments may be made when the warehouse code becomes effective.

Cincinnati—Volume from warehouses here, at unchanged prices, continues near the August tonnage. Ordering is chiefly for varied industrial lines.

St. Louis—Changes in mill prices on a number of commodities have not thus far reached warehouses, quotations remaining stationary on all standard items. Demand holds well.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore*	2.60c
Boston††	2.65c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	2.65c
New York‡ (d)	3.10c
Philadelphia*	2.60c
Pittsburgh	2.60c
Portland	3.15c
San Fran.	3.35c
Seattle	3.15c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS

Baltimore*	2.60c
Boston	3.25c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia*	2.60c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS

Baltimore	2.35c-3.00c
Boston	2.75c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.00c-2.45c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	2.75c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	3.50c
New York(d)	3.10c
Philadelphia*	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.35c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES

Baltimore*	2.60c
Boston††	2.75c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼ in. and thicker	2.95c
Cleve., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	3.50c
New York (d)	3.30c
Philadelphia*	2.60c
Phila. floor	4.35c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.35c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE

Baltimore*	2.75c
Boston††	2.65c
Buffalo	3.10c
Chattanooga	3.44c
Chicago	2.85c
Cincinnati	3.05c
Cleveland	2.75c
Det., 8-10 ga.	2.90c
Houston	3.35c
Los Ang.	3.45c
New Orleans	3.25c
New York	3.00c
Portland	3.75c
Philadelphia*	2.75c
Pitts.**	2.85c
San Fran.	3.53c
Seattle	3.75c
St. Louis	3.10c-3.25c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK

Balt.*†	3.25c
Boston††	3.75c
Buffalo	3.25c
Chattanooga	3.50c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	4.05c
New York	3.65c
Philadelphia*†	3.30c
Pitts.**	3.40c
Portland	4.50c
San Fran.	4.15c
Seattle	4.50c
St. Louis	3.60c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS

Balt.*†	3.75c
Buffalo	4.00c
Boston††	4.25c
Chattanooga	3.95c
Chicago	4.00c-4.10c
Cincinnati	4.15c
Cleveland	3.85c
Detroit	3.85c
Houston	3.57c
Los Ang.	4.65c
New Orleans	4.25c
New York	4.00c
Pitts.**	3.75c-4.00c
Portland	5.00c
San Fran.	4.75c
Seattle	5.00c
St. Louis	4.25c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	3.75c

†BANDS

Baltimore	2.90c
Boston††	3.15c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	3.00c
New York(d)	3.30c
Philadelphia	2.90c
Pittsburgh	2.95c
Portland	3.65c
San Fran.	3.15c
Seattle	3.65c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.20c

†HOOPS

Baltimore	2.80c
Boston	4.90c
Buffalo	3.55c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia	3.15c
Pittsburgh	3.60c
Seattle	5.15c
St. Paul	3.75c

COLD FIN. STEEL

Baltimore (c)	3.33c
Boston (g)	3.70-4.20c
Buffalo	3.00c
Chattanooga*	3.90c
Chicago	3.25c
Cincinnati	3.57c
Clevel'd, flats	3.40c
Do., rounds squares, hexagons	3.25c
Detroit	3.40c
Los Ang.	5.85c
New Orleans	4.25c
New York	3.79c
Philad. (c)	3.35c
Pittsburgh	3.20c
Portland (f)	4.50c
San Fran. (d)	5.85c
Seattle (f)	4.50c
St Paul	3.20c
St. Louis	3.61c
Tulsa	4.65c

COLD ROLL. STRIP

Boston 0.100 in., 500 lb lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex, only.
(b) Net base straightening, cutting boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif
(f) Rounds only.
(g) Bessemer analysis extras not included

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

†New extras apply.

††Base 40,000 lbs., extras on less.

Prices at Detroit, Cleveland, New York, Chicago, Pittsburgh Cincinnati, Chattanooga and St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 3999 pounds, base; 4000 to 7999 pounds, 15 cents off; 8000 to 14,999 pounds, 30 cents off; 15,000 to 39,999 pounds, 50 cents off; 40,000 pounds and over, 60 cents off.

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 9.00c, Conn., for copper

Sheets	
Yellow brass (high)	14.75
Copper, hot rolled	17.12½
Lead sheets, cut to jobbers	8.25
Zinc sheets (100-lb. base)	9.00
Tubes and Pipes	
Seamless yellow brass (high)	16.37½
Seamless copper	16.62½
Rods	
Yellow brass (high, full turnings)	12.25
Naval brass	13.37½
Anodes	
Copper, untrimmed	14.50
Wire	
Yellow brass (high)	14.75

Old Metals

Dealers' buying prices, cents lb

No. 1 Composition Red Brass	
New York	5.00 to 5.25
Chicago	4.62½ to 4.87½
Cleveland	5.50 to 5.75
St. Louis	4.50 to 4.75
Heavy Yellow Brass	
New York	3.75 to 4.00
Heavy Copper and Wire	
New York	6.75 to 7.00
Chicago, No. 1	6.00 to 6.50
Cleveland	5.75 to 6.50
St. Louis	5.25
Composition Brass Borings	
New York	4.75 to 5.00
Yellow Brass Tubing	
Cleveland	4.00 to 4.25
Light Copper	
New York	5.50 to 5.75
Chicago	4.75 to 5.25
Cleveland	5.25 to 5.75
St. Louis	5.00
Light Brass	
Chicago	3.00 to 3.25
Cleveland	3.00 to 3.50
St. Louis	2.75 to 3.00
Lead	
New York	3.50 to 3.62½
Cleveland	3.00 to 3.50
Chicago	3.12½ to 3.37½
St. Louis	3.25 to 3.50
Zinc	
New York	2.25 to 2.50
Cleveland	2.25 to 2.75
Chicago	2.50 to 2.75
St. Louis	2.75 to 3.00
Aluminum	
Clippings, new, soft, Cleve.	13.00 to 14.00
Borings, Cleveland	5.00 to 6.00
Mixed cast, Cleveland	8.25 to 8.75
Mixed cast, St. Louis	8.00 to 8.50

Secondary Metals

Brass ingot, 85-5-5-5	9.00
Remelt aluminum No. 12	12.75 to 13.75

Metals

Prices Show Firmer Tendency, With Sales Gaining Moderately —Lead Most Active

New York — Nonferrous metals were somewhat firmer generally last week. This was especially true of zinc which had tended toward weakness recently. Copper and lead were firm. Tin moved slightly higher. Demand in general, while not in unusual volume, was improved over the preceding week. Lead continued relatively the most active.

Copper — Consumers came into the market for only small tonnages but shipments against contracts placed on sellers' books some time ago continued fair. August shipments declined moderately from the July volume and a further tapering is in evidence this month, however. Producers continued to quote electrolytic at the 9-cent level for delivery through December but some custom smelters were willing to take business for shipment into January at this figure. Foreign copper sold as low as 7.95c, c.i.f. European ports but firmed up near the close of the week. Copper producers continued to meet on a general code for the industry and early action is possible due to threat of government intervention.

Lead—Buying was heavy during the first two days of the week with leading producers more than equaling ore intakes. Buying over the balance of the period was fair but mostly for carlots. Prices remained firm but an advance for the time being at least is prevented by low prices abroad. No ore or metal has been diverted to this country as yet, however.

Zinc—A firmer situation developed with prime western available in more limited volume at 4.65c as the week progressed. Most sellers were asking 4.70c or were out of the market. Others were caring only for the immediate requirements of regular customers at the lower price.

Tin—Prices went higher as sterling tended to advance. The stronger tendency also was aided by higher prices in London. Spot demanded a premium at times. Business for the week was fair.

Antimony—The market was quiet with spot at 6.75c.

Aluminum—Less price cutting was evident in virgin grades.

Quicksilver Easier

New York—The quicksilver market is slightly softer and quiet, with the price range now approximately 50 cents per flask lower. Sellers now are quoting virgin flasks of 76 pounds at $63 to $64, net, in small lots for spot delivery.

Coke By-Products

Per Gallon Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Commercial xylol	0.26

Per Pound at Producers' Plants in 250-Pound Drums

Phenol	0.153 to 0.173

Per Pound at Producers' Plants

Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75

Per 100 Pounds Atlantic Seaboard

Sulphate of ammonia	$1.20

Soviet Ore Reserves Gain

Extensive geological research is claimed by the USSR chamber of commerce, Moscow, to have increased the established Russian reserve of iron ore from 730,000,000 tons in 1927 to 1,500,000,000 tons by 1932. In the same period, reserves of chromite have been increased from 1,700,000 tons to 10,700,000 tons, and of magnesite from 31,000,000 tons to 200,000,000 tons.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99%	Spot, N. Y.	Nickel
Sept. 9	9.00	9.12½	8.75	44.80	45.17½	4.50	4.35	4.65	*22.90	6.75	35.00
Sept. 11	9.00	9.12½	8.75	45.25	45.62½	4.50	4.35	4.65	*22.90	6.75	35.00
Sept. 12	9.00	9.12½	8.75	45.87½	46.25	4.50	4.35	4.65	*22.90	6.75	35.00
Sept. 13	9.00	9.12½	8.75	45.85	46.00	4.50	4.35	4.65	*22.90	6.75	35.00
Sept. 14	9.00	9.12½	8.75	46.75	46.50	4.50	4.35	4.65	*22.90	6.75	35.00
Sept. 15	9.00	9.12½	8.75	47.00	47.25	4.50	4.35	4.65	*22.90	6.75	35.00

*Nominal quotation. Market range 19.90c to 22.90c

Pacific Coast

New Selling Methods Thought Benefit to Trade—License Plate Requirements Placed—Demand Shows Slackening But Prospects Are Excellent—Pipe Buying at Standstill

San Francisco—(*By Air Mail*)—Awards were not numerous or heavy during the past week, less than 5000 tons being booked. The largest letting was secured by the Columbia Steel Co. for 2750 tons of black sheets for the 1934-35 license plate requirements of California.

All mills are now quoting identical figures on steel, and c.i.f. prices are no longer in effect, quotations now being on the base of f.o.b. dock. In general this means approximately $1 per ton advance.

Berkeley Steel Construction Co., Berkeley, Calif., secured 500 tons of plates for the dredging walls of the caisson for Pier E-3, east bay substructure of the San Francisco-Oakland bridge. The Union Oil Co. has awarded tanks for its Oleum, Calif., plant, involving 300 tons, to Steel Tank & Pipe Co., Berkeley Steel Construction Co., and Western Pipe & Steel Co.

Gulf Industries Inc., Pensacola, Fla., was low bidder on 3000 tons for a ship for Swayne & Hoyt, San Francisco. Plate prices are holding firm at the new base of 2.15c, f.o.b. dock, Pacific Ports.

The largest structural booking went to the Virginia Bridge & Iron Co., Roanoke, Va., and called for 475 tons for a plant at Trona, Calif., for the American Potash & Chemical Co. Macco Construction Co., Los Angeles, was awarded the general contract for a pier at Santa Barbara, Calif., for Pacific Western Oil Co., involving 1000 tons. Bids will be opened Sept. 27 for 658 tons for an overhead crossing in San Bernardino county, California, for the state. Quotations are firm at 2.15c, f.o.b. dock, Pacific Ports, on standard shapes and at 2.25c on wide flange.

Laclede Tube Co., St. Louis, has taken the contract for 3,050,000 feet of 1-inch black steel tubing, involving 2550 tons, for Boulder dam.

Sheets have been advanced and are now quoted as follows, f.o.b. dock, Pacific ports: Hot-rolled annealed, No. 10 gage, 2.32½c, hot-rolled annealed, No. 24 gage, 2.95c; galvanized, No. 24 gage 3.55c.

Seattle Awards Small

Seattle—Public works projects are developing rapidly, important jobs being up for figures in the Pacific Northwest during the coming 60 days. Steel awards show increasing volume.

Mill prices on shapes, plates and bars have been advanced from 2.10c, c.i.f., to 2.17½c, delivered warehouse. The new prices of the wholesale jobbing branch have been adopted, under code regulations, establishing uniform prices for the entire Pacific Coast. The list, effective Sept. 11, is complicated but roughly fixes a 3.41c base with differentials for specials and quantities. It does not recognize imported materials.

Awards this week totaled 1300 tons and included 500 tons of shapes, also castings, for state bridge over Dungeness river, Washington, to Pacific Car & Foundry Co., Seattle; 106 tons of shapes for a state bridge in Skagit county to Isaacson Iron

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Steel in Europe

British Iron Output Grows; All Markets Show Gains

London—(*By Cable*)—Production of pig iron in Great Britain in August rose to 362,700 gross tons from 343,900 tons in July, a gain of 18,805 tons. Active blast furnaces increased from 69 to 73. Steel ingot production in August was 551,300 gross tons, a decrease of 16,200 tons from the 567,500 tons produced in July. Iron and steel imports in August were 79,710 tons, a gain of 15,276 tons over the 63,434 tons imported in July. Exports in August were 154,682 tons, compared with 156,143 tons in July.

Steel markets are more animated, especially in semifinished steel, where prices are stiffening. Demand for scrap is increasing. The Continent reports a slight improvement in export business, especially from China and Japan. The Belgian domestic market is dull but the French and German trade is showing much better volume.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Sept. 14

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON		£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$13.54	2 18 6	$8.27	1 14 0
Basic bessemer	12.50	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	13.66	2 19 0	....	.....
SEMIFINISHED STEEL				
Billets	$23.15	5 0 0	$11.44	2 7 0
Wire rods, No. 5 gage	34.73	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$35.88	7 15 0	$26.77	5 10 0
Merchant bars	1.40c	6 15 0	.66c	3 0 0
Structural shapes	1.53c	7 7 6	.61c	2 15 0
Plates, †¼ in. or 5 mm.	1.71c	8 5 0	.86c	3 18 6
Sheets, black, 24 gage or 0.5 mm.	1.86c	9 0 0	1.27c	5 15 0
Sheets, gal., 24 gage, corr.	2.28c	11 0 0	1.60c	7 5 0
Bands and strips	1.60c	7 15 0	.83c	3 15 0
Plain wire, base	1.81c	8 15 0	1.18c	5 7 6
Galvanized wire, base	2.17c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.48c	12 0 0	1.27c	5 5 0
Tin plate, box 108 lbs.	$ 3.88	0 16 9	.....	.....

British ferromanganese $82 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$14.47	3 2 6*	$12.26	215	$12.15	300	$21.83	63
Basic bessemer pig iron	13.66	2 19 0*	11.12	195	11.34	280	24.08	69.50
Furnace coke	3.13	0 13 6	6.84	120	4.46	110	6.67	19.25
Billets	23.15	5 0 0	23.09	405	17.82	440	33.44	96.50
Standard rails	1.71c	8 5 0	1.82c	700	1.98c	1,100	2.07c	132
Merchant bars	1.42c	6 17 6	1.46c	560	.96c	535	1.73c	110
Structural shapes	1.81c	8 15 0	1.43c	550	.96c	535	1.69c	107.50
Plates, †¼-in. or 5 mm.	1.76c	8 10 0	1.77c	680	1.22c	675	1.99c	127
Sheets, black	2.07c	10 10 0§	2.21c	850‡	1.35c	750‡	2.26c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.59c	12 10 0	3.77c	1,450	2.61c	1,450	5.81c	370
Plain wire	1.81c	8 15 0	2.94c	1,130	2.34c	1,300	2.78c	177
Bands and strips	1.97c	9 10 0	1.61c	620	1.22c	675	1.99c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. a del. Middlesbrough. b Since January

Construction and Enterprise

New York

BUFFALO—Fedders Mfg. Co. met a loss of about $10,000 recently by fire, principally to its boiler room. Company manufactures automobile radiators and other metal equipment.

COXSACKIE, N. Y.—Coxsackie Mfg. Corp. has been incorporated with $5000 capital to conduct a machine shop business, by Curtis & Warren, Coxsackie, N. Y.

Illinois

CHICAGO—Western Steel Co., successor to United States Metal Products Co., is having plans prepared for an addition to its plant at 2300 West Fifty-eighth street.

CHICAGO—A. B. C. Coin Machine Co. Inc., 4816 West Grand avenue, has been incorporated with 100 shares capital stock to manufacture coin-operated machines, by Clarence W. Shaver, 140 North Dearborn street.

CHICAGO—Industrial Specialty Products Mfg. Co. Inc., 126 North Jefferson street, has been incorporated with 100 shares capital stock to manufacture metal and wood furniture and lighting novelties, by Isadore Sternberg, 120 North Jefferson street.

CHICAGO—Premier Porcelain Enameling Corp., 1539 South Fifty-second avenue, Cicero, Ill., has been incorporated with 100 shares capital stock to manufacture porcelain metal ware, by Illinois Corporation Service, 5704 North Hermitage avenue, Chicago.

Southern States

NEW ORLEANS—Standard Brewing Co., Charles C. Trainer, engineer, has plans completed for alterations to its plant and additions, including boiler house, garages, cellars and brew and malt house, to cost about $35,000.

Oklahoma

OCHELETA, OKLA.—Midland Natural Gas Co. has been incorporated with $10,000 capital to operate a natural gas system here.

MIAMI, OKLA.—United Mining Co. has been incorporated with $10,000 capital to operate lead and zinc mining properties, by R. E. Wright, Cardin, Okla.

Texas

KILGORE, TEX.—Jack Refining Co. has been incorporated with $12,500 capital to engage in oil refinery operations, by Frank Green, president.

KILGORE, TEX.—Hercules Gasoline Co., Shreveport, La., has been chartered to operate in Texas, with L. J. Dales, manager, and headquarters at Kilgore. Investment in gasoline plants is planned.

McLEAN, TEX.—Smith Bros. Refining Co. has been incorporated with 1500 shares no par value to operate an oil refinery, by Vesper Smith, president and general manager.

LIBERTY, TEX.—T. & L. Tool Co. is building an addition 30 x 70 feet to enlarge its welding department.

MIRANDO CITY, TEX—Charco Redondo Refining Co. has been incorporated with $6000 capital to operate an oil refinery here, by H. C. Rodgers.

LONGVIEW, TEX.—Carlisle Machine Works has been incorporated with $10,000 capital to do general machine work, by Claude Carlisle, owner and manager, 311 East Cotton street, Longview, Tex.

WICHITA FALLS, TEX.—Automatic Oil Burner Inc. has been incorporated with $5000 capital to manufacture oil-burning equipment, by A. L. Huey, 711 Scott street.

Wisconsin

DE PERE, WIS.—DePere Brewing Co. will spend about $75,000 remodeling, enlarging and re-equipping its brewery. Contract for the refrigerating system has been let to Vilter Mfg. Co., Milwaukee.

MADISON, WIS.—French Battery Co. has bought control of the Gold Medal Products Co., Waukegan, Ill., manufacturer of chemical products, and will transfer production to its plant here.

MARSHFIELD, WIS.—Bids are being taken by board of public works for construction of a sewage disposal plant with daily capacity of 750,000 gallons. L. H. Kessler is consulting engineer.

WAUKESHA, WIS.—Michael Yundt Co., 225 Grand avenue, manufacturer of bottle-washing machinery for dairies and breweries, will let contracts about Sept. 15 for a 1-story brick and steel machine shop addition 60 x 130 feet, to cost about $50,000 with equipment.

STEVENS POINT, WIS.—Board of education has engaged Potter & Law, architects, 1 South Pinckney street, Madison, Wis., to prepare plans for a proposed high school to cost $350,000. F. A. Neuberger is secretary of the board.

South Dakota

SIOUX FALLS, S. DAK.—Clas & Clas, architects, 759 North Milwaukee street, Milwaukee, are completing plans for rebuilding the plant of the former Jones Seed Co. into a brewery for the Sioux Falls Brewing Co. The investment will be about $150,000.

Idaho

MINADOKA, IDAHO—United Iron Works, Oakland, Calif., has taken contract for pumps for the reclamation project here, at $11,350.

Pacific Coast

LOS ANGELES—Union Oil Co. of California has let a contract at about $250,000 for additions to its Oleum Refinery to Consolidated Steel Corp. It includes improvement of lubricating units and construction of new refinery towers.

PORTLAND, OREG. — Willamette-Erstad Co. has placed in production a machine to briquet sawdust and wood waste, electrically operated, with screw and hydraulic pressure. Machines are being manufactured for Wood Briquettes Inc., Lewiston, Idaho, R. T. Bowling, chief engineer.

PORTLAND, OREG.—Drake, Wyman & Voss have been awarded a contract for constructing a second addition to the Portland crematorium, to cost $15,000. Plans are by Fred T. Webber, architect, Governor building, Portland.

MT. VERNON, WASH.—Skagit county has retained J. W. Bowerman, Seattle, engineer, to prepare plans for a steel and concrete highway crossing at Swinomish slough, to cost about $60,000.

PULLMAN, WASH. — Regents of Washington state college have had plans made for a building program involving expenditures of $740,000, including a powerhouse, chemical building and science hall.

SEATTLE—National Brewing Co., 4053 Rainier avenue, has awarded a general contract for remodeling its plant according to plans by Fred B. Stephen, architect, Smith tower, Seattle.

SEATTLE—Hemrich Brewing Co. has let general contract to Hendrickson-Allstrom Construction Co., Seattle, for 6-story steel and concrete plant at 5225 East Marginal way, to cost $350,000. John Graham is architect.

SPOKANE—Plans have been made by Henry Bertelson, architect, for a proposed $60,000 hangar for the forty-first division aviation corps at Felts field.

SNOHOMISH, WASH. — Clarence Hickey, engineer, Everett, Wash., has been retained to prepare plans and supervise construction of a gravity municipal water system.

Dominion of Canada

TORONTO, ONT. — Standard NRA Products, Canada, Ltd., a subsidiary of Standard Products Co., Cleveland, is establishing a plant in Toronto for the manufacture of automotive parts and assembling of bicycles of English make. Motorcycles will be manufactured later.

Pacific Coast Markets

(*Concluded from Page* 53)

Works, Seattle; Reinforcing: 200 tons, state highway projects, to Northwest Steel Rolling Mills, Seattle, and 100 tons for ward and commissary at state hospital Steilacoom, Wash; 200 tons, addition to state hospital at Medical Lake, Wash., to Builders Supply Co., Spokane. Seattle Hardware Co., representing Republic Steel Corp., was awarded 160 tons of steel for auto license plates on bids of 3.54½ for 27 gage and 3.29½ for 24 gage. Todd Dry Docks Inc., Seattle, has a $100,000 contract for repairing the steamer ALEUTIAN, involving considerable plate work.